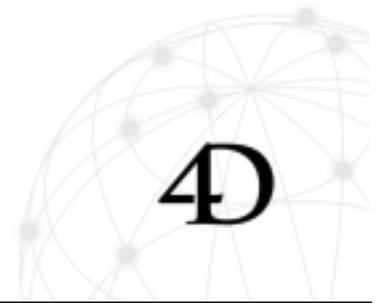# 4th Dimension's Low Administrative Requirements

Many companies have chosen 4th Dimension (4D) for its power, flexibility, and reliability. For most companies though, 4D's low administrative requirements are often the most important factor in selecting 4D as their application server.

This white paper discusses how a 4D database is maintained, and shows how 4D will usually offer a lower cost of ownership when compared to other products.

TYPICAL 4D MAINTENANCE TASKS

4D has a very simple set of files that are required for a database application. This simplicity is a major reason why 4D is so easy to maintain.

A 4D database has two principal files:

The structure file

The structure file, which contains the database design, data definitions, methods, forms, and application logic. If the application logic has been compiled using the 4D Compiler, the structure file's methods are in a machine-native form, and execute with optimized performance.

The data file

The data file, which contains the records and indexes. When installing a 4D database, the 4D database application is installed, using a simple GUI installer. There are no DLL's or other libraries needed, as everything is contained within the 4D, 4D Client, or 4D Server application. The lack of these files reduces the complexity of a 4D installation, as well as reducing the troubleshooting effort when problems arise.

The database application's structure file and data file can be installed in any directory, and in the case of a multi-user 4D Server application, need only be installed on the 4D Server machine. In this multi-user scenario, the 4D Client application will automatically download, and cache locally the structure file components on an as-needed basis, with no effort required from the developer, a DBA, or the user.

Updates to the application programming are easily made to a production database. Add a few features, modify the table structure, and simply replace the existing copy of the 4D structure file on the 4D Server computer. 4D will automatically recognize the new version, and distribute the changes to clients as they connect to the database. No additional human intervention is needed, and data doesn't need to be rebuilt or otherwise modified.

There are no requirements for a DBA to perform maintenance tasks on tables or indexes, as 4D automatically handles these activities. 4D's database engine will automatically handle all mapping of indexes, tables, and other database data structures, eliminating the need for a DBA to periodically rebuild and re-map indexes, tables, etc.

For situations where the database server will be running remotely from the support team, the available 4D InstallMaker utility can be used to automate the installation of the structure file. 4D InstallMaker lets you create a simple GUI installer for the user to launch, which then handles the details of the installation. This further simplifies the process for the end user, which reduces training requirements and the possibility of error.

ABERDEEN GROUP STUDY VALIDATES 4D

According to the Aberdeen Group (4D Embedded Database Cost of Ownership Study: An Executive White Paper, May 2001), 4D has a lower administrative burden than other database environments. This means that you can distribute 4D applications to departments and remote locations without having to dedicate expensive DBA-type resources. Their conclusions included:

"The cost of ownership of 4D's v6.7 Internet Embedded databases is 1/3 the industry average."

"4D v6.7 has a clear superiority in VCO (Visual Cost of Ownership) with respect to the industry average performance of embedded databases."

"4D's v6.7 superiority is primarily (but not entirely) due to 4D's ability to achieve 'install and forget it' deployment and 'near-lights-out' administration. Users cite the emphasis in 4D v6.7 on increasing data stability and thus minimizing management overhead. 4D's superiority is likely not just to continue, but possibly to increase."

4D'S HIGH RELIABILITY AND AVAILABILITY MINIMIZE ADMINISTRATIVE BURDEN

With the innovative features of 4th Dimension, you can easily maximize the reliability and availability of 4D applications. Maintaining a high level of reliability and availability is an important factor in minimizing the administrative tasks required for a database application. The database engine of 4D includes a self-analyzing process that will identify many forms of possible data corruption. For example, data fields and indexes have checksums, and when 4D detects potential data corruption, it records information about the record in a special area of the data file, which is used when running the 4D Tools application. These built-in automatic functions result in real-world databases that rarely experience corruption or need to be rebuilt. But on the rare occasion when damage is reported and is beyond the capabilities of the built-in functionality, there are several tools available. The 4D Tools application, a standard part of the 4D environment, can perform additional detailed analysis and repair. Several third-party products are available, such as SanityCheck and DataCheck from Committed Software, which extend the analysis and repair possibilities even further.

Also integrated into 4D is a backup module called, appropriately enough, 4D Backup. This module allows quite a bit of flexibility for implementing automated backups, logging, mirroring, and more. A flexible user interface is available to simplify DBA interaction, and for a situation where automation may be required, the 4D Backup API extends the 4D language with commands that allow a 4D programmer to build the module's functionality into an application.

4D's Internet Commands plug-in allows you to easily add automated alert features to an application. For example, in the event of certain error conditions, you could design an application to automatically send an e-mail to alert the appropriate technical personnel about the problem in order to allow a more rapid response.

AN ESTABLISHED RECORD OF SUCCESS

4D has been used for 14 years to create powerful, mission-critical applications. In many enterprise projects, the 4D team was competing with other teams using well-known products, yet was able to deliver the 4D system in less time, at a lower cost, and with a superior interface and level of performance.

"Lockheed Martin has used 4D for over 13 years to create many departmental and workgroup applications supporting a wide variety of business needs. 4D is an innovative and flexible technology to use for creating these applications. My group's ability to rapidly develop and deploy custom applications clearly distinguishes 4D from most other database platforms on the market. One of the most important reasons we keep using it for new projects is that once we deploy a 4D application, we are able to maintain the system with minimal resources and attention. For example, none of our 4D applications requires a full-time DBA. In addition, with 4D's new Web Application Server functionality, we can now deploy an application on any employee workstation with no installation of software on the desktop other than a standard Web browser."

— Tim Hall, Group Leader, Custom Applications, Lockheed Martin