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## ***The Advantage Database Server – a Primer***

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### **Introduction**

The Advantage Database Server is the database used by **Animal Intelligence**, AIS' flagship Windows product. This document briefly describes what it is, how it works, and in general how it is configured.

### **Client/server vs. local databases**

The Advantage Database Server is of the class of databases called Client/Server databases, so called because the responsibility for managing the database is primarily handled by the file server. By contrast, local databases, the other large class, are handled exclusively by each client workstation. In a local database system, the file server is nothing but a shared hard disk.

There are several benefits gained from using a client/server database over a local database: increased security, increased reliability, speed, and control.

### **Why Advantage?**

There are a number of client/server database products on the market. Why did AIS go with Advantage? The primary reason was cost. All client/server products are stable, reliable, and most are pretty fast. However, most are very expensive to purchase and require heavy maintenance by the end-user which increases total cost of ownership for the client. Advantage, on the other hand, is relatively inexpensive per seat to license and requires no maintenance by the end-user – it is *self-tuning*.

### **Advantage history**

Advantage was originally developed as a client/server alternative for dBase format data files being manipulated by the database programming language CA-Clipper. This is important because when it was originally developed, both memory and hard disk space on file servers and client computers were expensive and limited, so Advantage's designers had to write fast, clean, compact code. This design philosophy carries over to today – Advantage 5.6 can be installed using three 1.44MB floppy disks, including its base management utilities.

On the other hand, most other client/server database products were designed for use on mini or mainframe computers where disk space and memory were less of an issue. As a result, they tend to be larger programs and require significantly more resources.

### **Network environment**

Advantage requires either Novell NetWare or Microsoft Windows NT to be running as the file server's operating system. The client computers on the network can be running anything from MS-DOS to Windows 95/98/NT/2000.

Advantage's roots are with NetWare, where IPX was the only protocol originally supported. For this reason, an Advantage application will to this day attempt to use IPX for communication between the server and the client, if it finds it on either the server or the client. This is a problem since a great deal of time can be wasted sending packets of information to a server that doesn't have IPX installed, or to a client that doesn't have IPX installed.

Advantage can also communicate using the TCP/IP protocol. TCP/IP is the protocol used by the Internet, and is overwhelmingly used in corporate networks these days over virtually every other protocol. In a Windows NT network, TCP/IP is the protocol we *require*.

### **Protocol issues with IPX**

In a NetWare environment where IPX is used, the biggest "gotcha" is the frame type setting. You find this in IPX Properties in the "Advanced" tab. Frame type can be set to 802.2, 802.3, or Automatic for most network adapters. It is far better to set it to a specific setting (802.2, 802.3, it doesn't matter) than leave it to Auto.

### **Protocol Issues with TCP/IP**

TCP/IP is a very complicated suite of protocols and standards, and whole books have been written just explaining its intricacies. For our uses, though there are a few salient points:

*Dynamic vs. Static IP addresses* – a TCP/IP network requires that each device on the network be uniquely identified by a four-number series of the form w.x.y.z, where each variable is a number from 0 to 255 inclusive. The Internet is a global network, so when you connect to it via any means you have to be uniquely identified to be following the rules. Most dial-up Internet accounts use *dynamic address assignment* to assign you a temporary address from a pool of available addresses; this address is only "yours" for as long as you are connected. When you hang up, your address is put back into the pool of available address for use by the next person dialing up.

Dynamic assignment works well for devices that only connect occasionally for a short time. However, for devices that are continuously connected to the network or must be able to be identified each time they connect, *static address assignment* is available. With this scheme, the device is assigned an IP address once and it retains that address "forever." Thus, it can be addressed the same way whenever necessary.

*Network addressing* – Most TCP/IP addresses are world-visible; that is, they can be seen by anyone on the Internet as long as they are connected to it. There are two or three ranges of IP addresses that are reserved exclusively for small, corporate *intranets*. The one we recommend that our clients use is 192.168.1.x, where x is a number between 0 and 255. This provides for up to 255 devices on the network.

*Naming* – it is important to name each computer on a TCP/IP network. It is most important that the server have a unique name because Advantage requires that the application be able to find the server using its name. You can verify this using the MS-DOS utility program *ping.exe*.

### **Other network issues**

There are some other issues to do with networks, but they go beyond this introduction.

### ***AIS TCP/IP Requirements***

At AIS, we require users to use static IP addresses in TCP/IP networks.

### **Advantage Usage**

Once the network is set up, installing Advantage is simple. The CD is installed and an automated installer takes it from there except for entry of the client name, serial number and authorization code.

Once set up, there are a few settings to be handled in the Advantage Configuration Utility; these are outlined in the attached document, “Installing AI on a Client System.”

### **How Advantage Works**

Advantage removes the burden of managing database index pages from each client workstation, transferring them to the file server instead.

### **Verifying that an AI installation is using Advantage**

The only way to verify for sure that **AI** is using Advantage is to check the Database Info tab of the Advantage Configuration Utility. This program runs on the server; you can install a remote management utility on a workstation that allows you to view, but not modify, the Advantage settings.