

MYOB Exo Business White Paper

Exo Business DCE

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Introduction

Overview

The Exo Business Dynamic Commerce Engine, or Exo Business DCE, is the middleware server application used in a multi-tier Exo Business deployment. This application runs between the client application (for instance, Exo Business.exe), and the database server (MS SQL Server).

The use of the middleware reduces the bandwidth requirements between the client and middleware, assists in simplifying the deployment of larger implementations, and centralises business logic. This allows greater scalability and more flexible deployment options for the end user, the implementer, and the network administrator.

Features of the Exo Business DCE

The Exo Business DCE provides the following benefits:

- Improved efficiency in network communication, reducing the need for large data pipes between the client and the middleware, providing Wide Area Network (WAN) and remote access capabilities to standard Exo Business installations.
- Ability to run the middleware on multiple computers, providing greater flexibility and scalability to Exo Business installations, including more flexible client and server implementations.
- Improved security management, providing a controlled separation of the SQL database and client activity.
- Centralised point of management for client diagnostics

System Requirements for the Exo Business DCE

To operate successfully, the recommended minimum system requirements to implement the Exo Business DCE are:

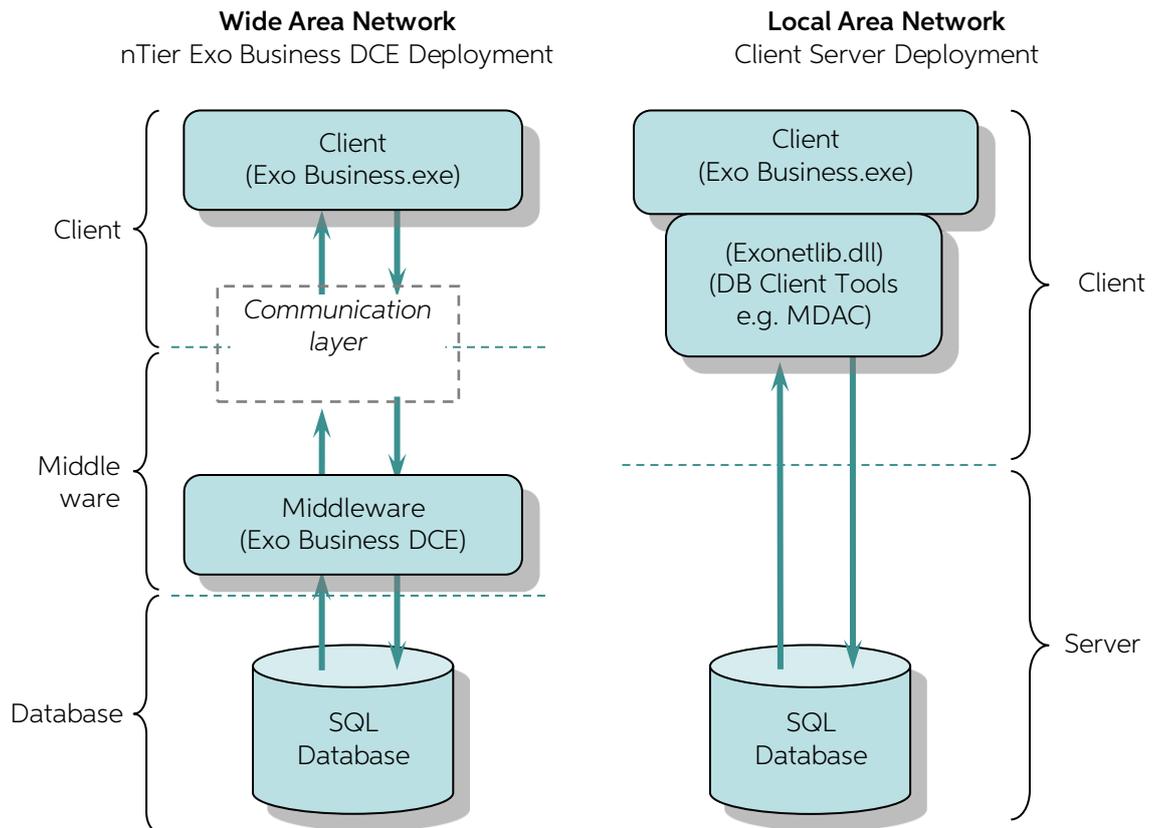
- Windows 2000 Server operating system, with the latest operating system service packs
- 256MB of memory or more, dependant on load
- TCP/IP based network

Optional additions:

- If HTTP connections are to be used, Microsoft IIS server with the latest patches must be available.
- If HTTPS connections are to be used, a valid Secure Certificate must be available. Note: A test certificate is not valid.

Additional suggestions for greater performance:

- Additional memory if required to prevent hard disk paging
- Installation on a dedicated middleware server, with fast dedicated network connection between the middleware server and database server



Planning the Exo Business DCE Solution

Overview

An MYOB Exo Business installation using the Exo Business DCE can be very flexible. The performance of the system depends on a number of factors, including both hardware and software options. Getting the right mix takes some thought and planning.

It should be remembered that the Exo Business DCE relies on advanced Windows networking technologies, and optionally Internet technology. Deploying the Exo Business DCE therefore requires a good practical understanding of networking technologies and topologies, Internet or remote access services (RAS), and general Windows server operating system installation and diagnostic skills.

This section introduces many of the concepts involved.

Exo Business DCE and the Database

The Exo Business DCE performs the database communication with the SQL server. This has multiple benefits:

- Enhanced security management, providing a controlled separation of the SQL database and client activity, including usernames and passwords.
- Removes the need for any client database connectivity configuration – the client simply requires access to the Exo Business.exe program file, and connection information to locate the Exo Business DCE.
- No database level password is required at the client workstation – individual application level passwords are used. Whilst the password is encrypted with a standard non-DCE Exo Business installation, it still requires someone at some stage to enter the database username and password on the client's workstation.
- The Exo Business DCE only passes the query results to the clients on an "as needed" basis, and helps manage the data of large query results. Complicated database queries are performed with the middleware, which has optimised access to the database server. This reduces the amount of data being communicated between the client and the middleware server, reducing the need for large data pipes between the client and the middleware.
- The combination of simple client configuration, reduced data traffic between the client and the middleware, and enhanced database security separation provides great remote access capabilities when compared with standard Exo Business installations.

Exo Business DCE versus Client/Server

The advantages and disadvantages of an n-tier Exo Business DCE setup compared with a 2 tier Client/Server setup mainly focuses around the network layout, client and support needs. An n-tier system can co-exist alongside a 2-tier system in the same network, and occasionally a mixed solution may have advantages.

Feature/ function	With the Exo Business DCE (n-tier)	Without the Exo Business DCE (2-tier)
Remote connections	Lower bandwidth requirements between the client and the server making remote connections over dialup possible, and WAN connections much more efficient.	Not normally practical without a larger bandwidth connection, or use of other third party screen/keystroke sending programs.
Client setup	Single file client deployment. Simply require the Exo Business.exe file (local or network central). Lower implementation costs in larger deployments.	Requires Exo Business program (.exe and .dll file), and database client files.
Database connection information	Non-confidential connection information, plus personal username and password. The database-level password is not required in any form at the client.	Requires normally confidential database-level password setup once by the administrator (stored encrypted locally), plus personal username and password
Network connection monitoring	The middleware provides good username and machine name connection tracking.	Done through a combination of network tools, and database server tools.
Server hardware/ Configuration	Often requires more server-level hardware for the middleware. Could be installed on the database server in smaller sites. Requires some middleware server configuration.	Database server required in multi-user site

Using the Exo Business DCE in a LAN

Given one of the main advantages of the Exo Business DCE is efficient client/ server bandwidth utilisation, does the Exo Business DCE have a place in a LAN situation where this requirement is normally not so critical?

Similarly, if the Exo Business DCE is already being used for remote connections, should it be used in the LAN as well?

Although optional, the main reasons for using the Exo Business DCE in a LAN situation are centralised network management, ease of client deployment and associated support advantages.

Client Files

An Exo Business DCE client simply requires the Exo Business.exe file (plus any add-on Exo Business modules). In a LAN situation these will probably be stored centrally on a file server, so to deploy, only a shortcut to the program will need to be set up.

In comparison, a non-DCE client will also need client database connection files installed. With Microsoft MS SQL the MDAC (Microsoft Data Access Components) will need to be installed if they are not already on the computer. Although this is generally a simple task, it is something that must be done and supported on the client computers.

Using the Exo Business DCE in a LAN will simplify client deployment, and therefore normally reduce the cost of support, including rolling out new users, moving users or upgrading computer systems, or debugging connection issues. Creating a shortcut to a server is a very simple installation.

Connection Information

Once the client files are ready, the connection to the database must be configured. This must be done before Exo Business can manage the end user names and passwords within the Exo Business application.

Without an Exo Business DCE connection (that is, a standard 2 tier configuration), when a client is deployed the administrator must enter in the confidential database level username and password into the client computer, which is then encrypted and stored locally. This is needed in addition to the server name and database path.

With an Exo Business DCE connection, a 'non-confidential' connection name is all that is required. This can therefore simply be done over the phone without needing to share any confidential information with the user.

Network Connection Type and Data Considerations

Exo Business with the Exo Business DCE is designed to operate over narrower bandwidths than conventional applications. However, the type of network backbone used and the actual network data transfer speed can have a major impact on the system performance.

Protocol Configurations

A variety of transfer protocol configurations are available to use with the Exo Business DCE. The question of which option to use depends upon:

Network type – LAN vs. WAN

Network administration, firewall and security constraints

Data traffic security concerns

Sockets

Sockets is probably the simplest protocol option to implement, and depending on the site, often gives the best performance for remote connections. However, in some situations Sockets may not be useable due to firewall or security requirements imposed by the network or network administrators.

A Socket implementation requires the installation of a single service on the middleware server (scktsrvr.exe), in addition to the Exo Business DCE program and configuration.

DCOM

DCOM is normally the fastest over a LAN configuration, but can require more network administration/ security configuration. DCOM generally provides more deployment and configuration challenges than other protocols in a WAN situation, and is not usable in 'pure' Internet connections. For these reasons, Sockets (or HTTP) would normally be used in preference.

HTTP

HTTP is probably the most popular protocol used in an Internet environment. As such it generally 'gets through' network and Internet connections without being blocked by firewalls. However, there is more 'overhead' in processing data (encoding and decoding the data from the HTTP packet), so is generally slower than a Socket connection.

An HTTP connection also requires a server running Microsoft IIS, which will require additional configuration and maintenance.

HTTPS

HTTPS is an extension of the HTTP protocol, but with the ability for the data packets to be encrypted. This makes HTTPS the most secure method. But the overhead of encrypting and decrypting the data packets generally makes HTTPS the slowest of the methods. Setting up an HTTPS connection also requires a true secure server certificate on the IIS server.

Network Bandwidth and Latency

There are generally two parameters to consider with communication, bandwidth and latency. Bandwidth is the amount of information that can be transferred in a fixed amount of time. Latency is the time that it takes for information to travel from one end to the other.

Using a water pipe as an analogy, the wider the pipe the more water that can flow through it - bandwidth. The faster the water flows through the pipe, the less time it will take from turning on the tap to getting the first spurt of water out - latency.

With a WAN n-tier connection, the largest portion of this time is usually in the network system performance combining both the network bandwidth and latency.

Bandwidth

The bandwidth generally has an impact on larger amounts of data; the time it takes to transmit a block of data being requested is proportional to the network speed.

Remotely requesting a report containing 1MB of data on a 56Kb dialup connection will obviously take a while, and will obviously be much faster on a 100Mb local area network. So trying to print a 100 page report with graphics over a 56K dial up connection may not be very good daily practice. If high data traffic is a requirement of a remote client, then alternatives will need to be made.

The bandwidth of the network connection is normally specified (e.g. 56k, 100Mb). It is worth considering that some networks specify a Committed Information Rate (CIR) as a continuous rate, with the ability for occasional burst rate (peak for irregular bursts of data usage).

Latency

Generally a request for information is a small piece of information or small data packet (e.g. a client requesting data from the server). But the latency in getting this information from the client to the server also takes time – the time it takes for the client to assemble the query in the right data format, the network to transport the request, and the server to receive and unbundle the request back to a data format the server understands. Even with a very small data request, there is still latency time. Latency is normally completely independent of the bandwidth.

Bandwidth and Latency Together

If a user is accessing Exo Business, performing general data entry such as invoicing (interactive work, which generally requires a number of queries of small data size), then latency will probably have the greatest impact on performance.

If large reports or working with large volumes of data are being used, then bandwidth (or lack of it) will have more impact.

As an example, many data transfers are very small (a few KBytes), so with a 56K modem connection this is about 0.3 of a second for the actual data transfer. But add in a 1 second latency and the perceived 'user response' time becomes much more of an issue. If the modem bandwidth was increased to 100Mb (if that was possible), this may make the data transfer time negligible, but the 1-second network latency would still be perceivable to the end user.

Direct Connect vs. Internet

Direct network connections are faster than the public Internet.

The time it takes a 100Mb LAN to transport a request is generally 'negligible' when compared to a 56K dialup Internet connection. In a LAN there is generally only a piece of wire between the sending and receiving computer, with the very little there is in terms of packaging, decoding, or routing done at very fast system and network speeds.

But with an HTTP Internet connection between a client's notebook and their head office middleware server, the path could be much more convoluted:

- the overhead of the Exo Business data request being converted into HTTP packets,
- being sent from through the client's notebook firewall software,
- through a modem to the ISP,
- hopping through various internet points, routers and servers,
- until arriving at the head office firewall and routers,
- through to the IIS server, decoding of the HTTP packet
- and finally being processed by the Exo Business DCE.

And then the request is processed and the result passed all the way back again.

Networks, Users and Speed

As well as network bandwidth, latency, and the performance of the database server, the users 'usage profile' will also affect system speed. That is:

- The number of users
- The type of operations the users are doing
- Whether many users are using the system continuously or spasmodically during the day.
- Whether the users are working continuously together, or in different patterns (e.g. a sales call centre continuously taking calls, or sales centre that takes five enquiries per day)

As a general example:

- An average user would normally get satisfactory performance with a 64K link.
- So if 5 users are on the network, with each doing one transaction per minute, then all 5 could probably use that one 64K link.
- But if all 5 users used the system at once, this will become more noticeable.
- But 128K or 256K link could improve the response in any 'heavy usage' areas.
- A 256K link would therefore not be expected to slow down very much if 10 irregular users were using the system, and may be cost justified for say 5-10 users, depending on network cost price points.

If one user needs to do heavy reporting or database intensive work, then that might impact the other users. A larger 'pipe' should be used, the work could be performed out of hours, or that user could be given their own connection.

Data Traffic Usage

Whilst the Exo Business DCE will reduce the amount of data traffic between the client and the middleware, the amount data sent may still be an important consideration.

The amount of traffic will obviously vary depending on the client usage profile (number of users, stock ledger/ client ledger/ sales order size, and so on). Also if a virtual private network (VPN) is used, then it is very easy to accidentally send large files via the network.

For these reasons, it is not possible to give a "how much data per user" type estimation because the client usage profile will vary dramatically between sites – and even within by user within a site.

Similarly, remote network connections that are charged depending on data traffic usage is not recommended unless a method to monitor and control data traffic is employed.

Other Data Observations

Following are some general observations and comments about network types

- The type of network connection used can have an impact on communication latency. As a generalisation for comparison purposes, ADSL connection latency is normally less than 100 ms, a modem over a phone line is 250-300 ms, and satellite latency will be 600-900 ms. Whilst this is a general guideline, it shows some technologies can impact on performance significantly.
- The protocol being used has an impact on latency. In terms of processing overhead (encoding and decoding of data packets for transport), the fastest connection would generally be DCOM and Sockets, followed by HTTP, and finally by HTTPS.
- Firewalls, traffic monitoring and other data filtering technologies can have a big impact on the communication latency. When diagnosing performance, temporarily bypass firewalls to see if they are causing excessive delays.
- A 56k modem connecting directly to another 56k modem only transfers data at 33k. These modems require a digital connection at the ISP to obtain the 56k speed. Note this is also a download speed only, so two 56k modems connected through the Internet will not get the higher speed benefit "both ways".
- Which performs better – a 33.6K RAS (Remote Access Service) connection directly to a network, or a 56K dialup Internet connection to a corporate server with a high-speed Internet connection? In most circumstances the 33.6K RAS connection will outperform a 56K Internet connection (even if the server has a high speed connection to the internet), due to the extra latency and unpredictability of the Internet.

General Network Considerations

As the connection using the Exo Business DCE is essentially a network, standard network requirements need to also be taken into consideration.

File Locations, Reports Locations, and Product Updates

The connection between the client and the middleware server may be provided through a full workgroup or domain network connection, e.g. directly on the LAN, RAS or a Virtual Private Network (VPN), with access to network resources such as drives and printers. Or the connection may be a standard TCP/IP connection such as a standard Internet connection, where the client can locate a server via its IP address, and can send HTTP or socket traffic, but cannot access the servers file or print resources.

In the case of a standard Internet connection with no network resource access, there is no option but to store the executable files on the client computer, as the server file and print services are not available to the client. But if a LAN, WAN or VPN exists between the client computer and the server, there is the option of whether or not to store the client executable files (e.g. Exo Business.exe) on the remote client, or on the server. Which should be used?

Executables

Storing and running the executable files on the server means that every time the client starts Exo Business (or one of the companion modules), this large file is downloaded across the network. Downloading a 10MB file like Exo Business.exe may take over half an hour on a 56Kb modem connection – obviously not a practical solution. Even in a faster network, the startup time may be less, but it will use up bandwidth for other users.

The downside with not storing on a central server (decentralised file management) is update and upgrades will need to be managed carefully and 'manually'. A process should be put in place so when the database version is upgraded, then the client's local executable file also gets updated at the same time.

Reports

Reports may also be stored centrally on a file server if a network connection is present, or on the client machine. If these files are kept small (e.g. with no large graphic images), then it may be deemed more efficient to centrally store reports on the file server if a network connection is available. This would save the need to make sure all clients are running the latest version of reports.

With Clarity reports, it is also possible to store the reports inside the database. This means that even if there is no VPN connection to the central server is available (for instance, with a standard Internet connection), when a report is called Clarity will retrieve the report definition from the database. This feature is enabled by the computer profile 'Store Clarity files in the DB', and managed by the menu option 'Clarity Report Manager'. Again, care should be taken to keep the report size small.

Redundancy

Redundancy – having a backup if the main system fails – is important in any critical network. Redundancy may be necessary in different parts of the network, and can often be achieved in different ways.

- Standard server redundancy measures should apply to the middleware server, such as a UPS and mirrored system drives. Other more advanced redundancy should be considered depending on how critical the middleware is to the business, such as backup servers and the like.
- As the Exo Business DCE can support multiple connection protocols and connection types, with remote networks it may be beneficial to have alternative emergency network connections.

For instance, if a leased line connection is normally used for remote sites, having a normal modem dialup RAS or Internet connection available as a backup in emergencies for one user per site may be beneficial. Whilst slower, it may well prove useful in an emergency.

- If a web server/ IIS server is being used for HTTP data, a level of redundancy could be achieved by having a Socket connection available that can be enabled if HTTP failure occurs. Again this may only be available as a direct RAS dialup connection for emergencies or testing.
- A 'backup middleware server' could be achieved by having a second middleware server available on a general server (e.g. web server or file/ print server), which can be enabled if needed if the main middleware failed.

Of course, these recommendations are in addition to the critical database server-specific redundancy, data backup schedule and so on.

Security

Any network must take security into consideration. Network security is outside the scope of this document, and these issues should be discussed with a security expert. However, some issues to consider include network access and intrusion, connection auditing, password revision, regular reviews of operating system updates for security enhancement notifications, virus protection and other general computer network concerns.

The type of security measures taken will depend on the protocols being used and network accessibility to the general public. For instance, using Microsoft IIS with HTTP connections will require regular review for new and emerging security updates from Microsoft.

Consideration should also be given to 'less technical' issues such as the company policy about business data security, which may be even more relevant if remote access is given to staff.

Firewalls

As mentioned previously, firewalls can have an impact on network performance, when latency time is often key to user perception. This of course must be balanced with network security needs. It may be worthwhile to test the system with and without the firewall, to ensure the implementation used is not putting a large overhead in the system. However, usually a firewall is a critical part of the network, so should not be disconnected during normal use.

Firewalls may also need to be configured to allow the data traffic through. If using HTTP, then normally this will not be an issue. Socket connections may require some firewall configuration by the network administrator to allow Socket traffic to pass.

Flexibility

Designing a network with flexible bandwidth and scalability will be an advantage when putting in any new site, particularly if the usage pattern is not really known.

If a site grows, or the way it is thought people would use the system is different in practice, and the network is found to be the bottleneck, then having the ability to alter network bandwidth speed on demand will be a great benefit.

The key again (as with any network), is scalability so it can be tuned to a particular customer's profile.

Solution Recommendations

Combining all the network types, protocols available, issues with complexity of general database and Exo Business requirements, it can be seen there are many factors impacting on the network recommendations:

- What work users are doing – interactivity, data size...
- Database size and complexity – number of accounts, number of transactions, options enabled, complexity of pricing models...
- How many users are using the system, especially the number at the same time
- Burst usage, such as reporting
- Network type being used – permanent leased line, ADSL or analog modem dialup
- Protocols being used – Sockets or HTTPS
- Direct or indirect paths – LAN/ WAN, RAS dialup, VPN, public Internet

Then combine these with the usual price vs. performance question, and it becomes very hard to give generalisations. However, some general guidelines are given below.

Middleware Server Hardware

As with any computer implementation, the hardware requirements are a balance between performance and cost, and the cost today versus future expansion/replacement cost.

The middleware server should be treated like any general purpose server – ensure the system is scaleable so as the site grows, then the computer's hardware can be easily upgraded.

Technically there is no reason why the middleware server software couldn't be installed on the database server, web server, or other server in smaller sites. However, this will make it hard to diagnose which part of the system is causing bottlenecks if performance drops.

It is possible for multiple middleware servers to exist in a network, connected to the SQL server, so it is comparatively easy to scale with additional middleware servers should one server become overloaded.

In terms of the server's physical makeup, any general modern server should suffice for the middleware server.

- A server operating system must be used (such as Windows 2000 server).
- As data being stored on the middleware server is only temporary, there is no special hard disk storage/ redundancy needs (other than standard server redundancy, such as mirrored operating system drives).
- Memory usage will depend on how the system is used, and as usual physical memory is faster than paging to hard drive. As a guide a 256MB RAM starting point should suffice for most general implementations. About 5-10MB per user should be used a general guideline, although again this will depend on the sites specific usage profile.

The use of a middleware server does not significantly alter the operation or performance of the database server. The database server is as per standard database servers – fast raid level hard drives preferred, and sufficient memory to reduce disk/memory paging, with good redundancy and backup processes. A fast direct network connection between the middleware server and the SQL server would probably assist in larger sites.

LAN Connections

If the Exo Business DCE is being utilised in a LAN situation, the choice of protocol will normally be between DCOM and Sockets. This selection will normally come down to:

- Ease of configuration.
- If a Sockets connection is already being used for remote connections, and the desire is to only configure one method.

Whilst technically HTTP or HTTPS could be used, this would be an unnecessary overhead in a LAN situation, and would normally degrade the users performance.

WAN Connections

As always, the balance for price and performance will play a role in devising the best WAN network setup. The local cost considerations for various network connection methods for your region will impact on the type of WAN connection to use.

Remote Connections/Internet Connections

Sockets would normally be the protocol of choice for remote connections. If the network will not successfully route Socket data, then HTTP should be used. For optimum security on a public network, HTTPS could be considered.

For a site with occasional roaming local notebook users or “work from home” type users, a direct phone dialup 33.6K RAS connection should suffice for most general use. A 56k Internet connection should also give reasonable performance for a single general user.

For a heavier user, or for more regular use, a connection using an ADSL 128K or higher connection should give good performance. See the earlier section on “Networks, Users and Speed” for estimating sites with more than one user.

Internet connections, as mentioned earlier, can suffer from latency problems due to the number of “hops” the data takes between Internet servers. Internet connection performance can be unpredictable since the connection is subject to the traffic loading of the service provider, and the general network performance at that point in time. In theory distant connections between countries are very possible, but again will be subject to inconsistent traffic concerns. For instance, if satellite communication is used that may impact latency, and the ‘path’ the Internet Provider uses may vary.

Internet connections are normally fine for low usage/ simple usage connections, where performance criteria can be more flexible. However caution should be used in other more critical situations.

Installing the Exo Business DCE

Overview

While there are some common configuration steps, the level of configuration will depend on what transfer protocols will be used –Sockets, HTTP or DCOM.

The following installation example assumes the following:

- Windows 2000 has already been installed in the Windows default of **C:\WINNT**, with the windows system directory of **C:\WINNT\system32**.
- Microsoft IIS server is already installed if using HTTP connections, and is installed on the same server as the middleware.
- **The server is logged in using Administrator rights.**

This chapter covers the installation of all transfer protocol configurations – using Sockets, HTTP and DCOM. It may be useful to read all sections to help gain an understanding of the operation, even if those configurations will not be performed

File Installation

The **Exonet.exe** file (for middleware servers) and the **Exonetlib.dll** file (for direct-connecting clients) perform similar functions, and in a server environment appear similar to server applications. However, if **Exonetlib.dll** is installed on the middleware server, then clients will get errors when trying to connect to the middleware server.

Running Exo Business with a local database connection will cause Windows to look for **Exonetlib.dll**. If it is not registered Windows will look in the current directory for **Exonetlib.dll** and if found self-register. If this PC later becomes a middleware server, **Exonetlib.dll** will need to be de-registered.

Similarly installing Exo Business from an installation CD using the automatic Demo install will install **Exonetlib.dll**, so this method is of course not recommended to copy files onto a middleware server.

For these reasons, it is recommended that **Exonetlib.dll** never be installed on the Server, to avoid accidental self-registration.

If Exonetlib.dll has been installed, it must be correctly unregistered. See Troubleshooting for details on removing Exonetlib.dll.

Database Client Files (All Configurations)

As the middleware connects to the database, the middleware server must have the database client software installed - MDAC (Microsoft Data Access Components) for Microsoft MS SQL.

Install these options from the Exo Business CD, as normally performed during a standard Exo Business implementation.

Datasnap (MIDAS) Setup (All Configurations)

Midas.dll is required in an Exo Business DCE installation, as it is utilised by the Exo Business DCE, and the optional protocol specific files. To install the Datasnap file:

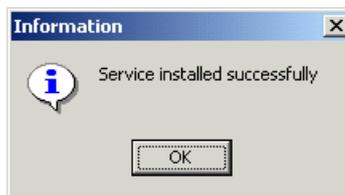
1. Copy the **midas.dll** file into the Windows system directory **C:\WINNT\system32**
2. From the Windows Start menu, select **Run**, and enter **regsvr32 C:\WINNT\system32\midas.dll**
3. If successful, the following confirmation will appear:



Exo Business DCE Service Installation (All Configurations)

The Exo Business DCE is installed as a Windows Service. This ensures the correct user permissions, and ensures the application is available even if there has been no user logon on the server. To install the service:

1. Copy the ExonetDCE.exe file into the **System32** directory.
2. Open a command prompt at the **System32** directory and run **ExonetDCE.exe -install**. This will install and register the service. If successful, a Service Installed message will appear.



Note: There are no spaces in the "-install" part of the installation line above. If the message "service installed successfully" does not appear, and the Exo Business DCE icon appears in the system tray immediately, then the service has not been installed correctly. It will be running incorrectly in temporary 'interactive mode', and the service will need to be reinstalled correctly.

3. Open a command prompt at the **System32** directory and run **ExonetDCE.exe -regserver**.

Note: When using versions of Exo Business prior to 8.5, the following registry keys must be created manually:
HKCLR\AppID\ExonetDCE.exe\Default
HKCLR\AppID\ExonetDCE.exe\AppId REG_SZ = {E319973F-A2CA-4555-8BC1-2795CE4CE799}

The Exo Business DCE service will not start at this stage, and indeed starting is not necessary at this stage until the rest of the configuration is performed. If the service should be started, it will need to be restarted to recognise any system permission changes that may be made later.

The process of starting the service (using the Window's Administration Tools Services manager, or by rebooting the server) will be covered later in this chapter.

Socket Server Service (Sockets Only)

To run middleware connections using Sockets, the Borland Socket Server should be run. While it can be run interactively, it is recommended that it be installed as a Windows Service as follows:

1. Copy the `scktsrvr.exe` file into the `C:\WINNT\system32` directory.
2. From the Windows Start menu, select Run, and enter `C:\WINNT\system32\scktsrvr.exe -install`. This will install and register the service. If successful, a Service Installed message will appear.



The Borland Socket Server service will not start at this stage, and indeed this is not necessary at this stage until the rest of the configuration is performed.

The process of starting the service (using the Window's Administration Tools Services manager, or by rebooting the server) will be covered later in this chapter.

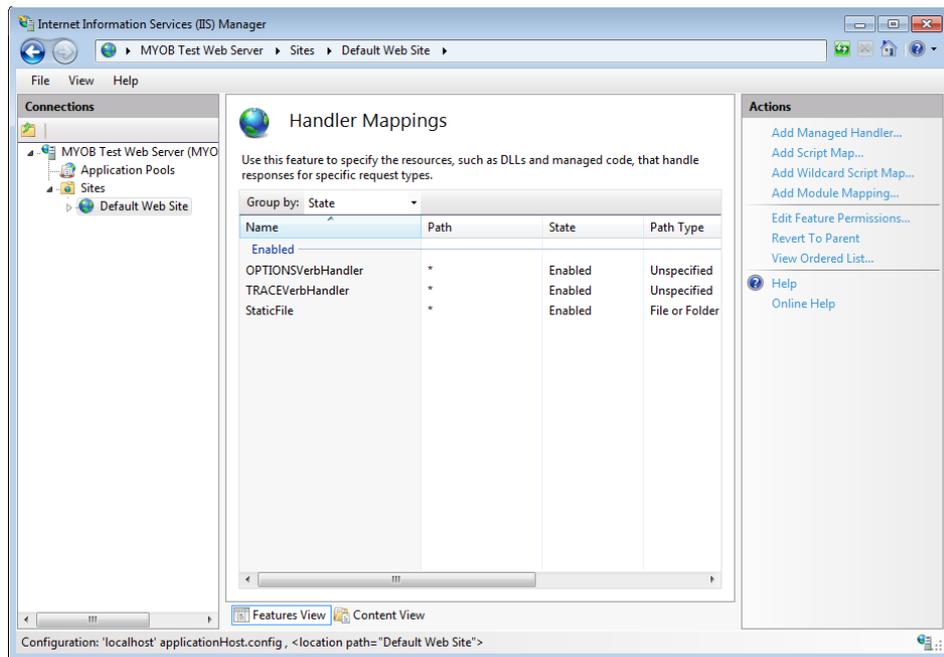
HTTP ISAPI DLL Installation (HTTP only)

To run middleware connections over HTTP, Microsoft IIS must also be available to this server. In this example it will be installed on the same computer as the Exo Business DCE.

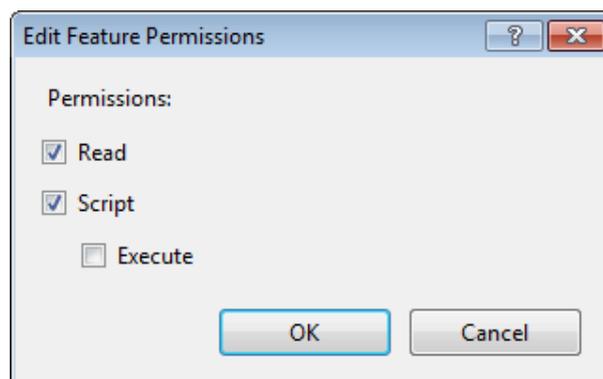
Configuring IIS

To enable HTTP transfers, the correct properties of IIS script running must be set.

1. Open the Internet Information Services Manager from Window's Administrative Tools menu. Double-click on the Handler Mappings application:



2. Click the **Edit Feature Permissions...** link:



3. Ensure that the **Script** and **Execute** permissions are ticked.
4. Click **OK** to close the window, and close IIS Manager.

Install the HTTP Server ISAPI DLL

The HTTP server file for the Exo Business DCE must be copied into the IIS Scripts directory. This file is simply copied into the correct directory; this does not require registering.

Copy the **httpsrvr.dll** file to the scripts directory of the IIS server. This is **c:\inetpub\scripts** by default, as specified in the local path settings of the scripts property, as shown above.

Ensure that accessing **httpsrv.dll** returns a blank page. To do this:

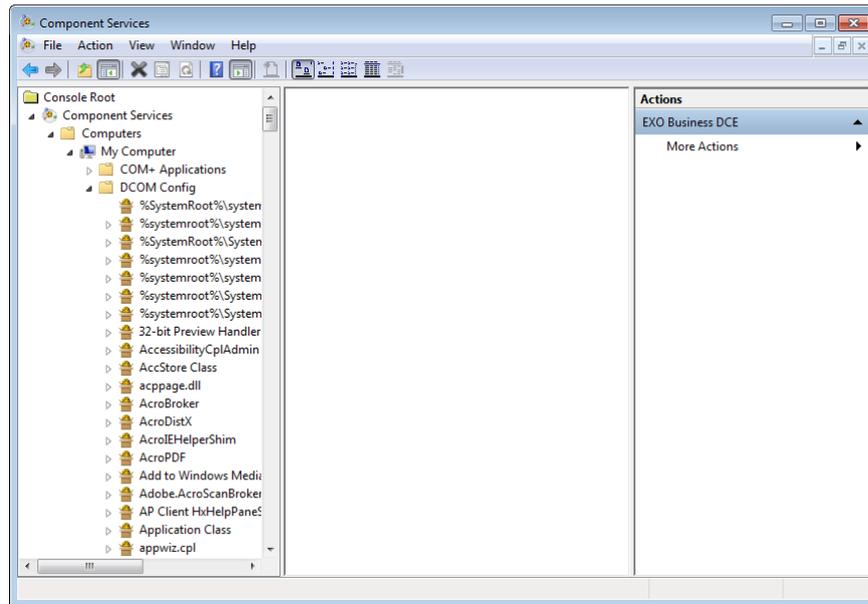
- For IIS prior 7:
 - Set DefaultAppPool to run as LocalService.
 - Set execute permissions to “Scripts and Executables” on the app and folder.
- For IIS 7+:
 - Create a new Application Pool with the properties Pipeline: Classic, Identity: LocalService and Load User Profile: True.
 - Go to Handler Mappings and enable and add a script map for *.DLL to HTTPSRVR.DLL. Access Required: Execute. Enable 32bit: True

Configuring Distributed COM Server Permissions

In order to connect via the middleware server, permissions must be granted on the server to access the Exo Business DCE. All methods – HTTP, Sockets and DCOM – require the server to be configured as detailed below.

Configure the Exo Business DCE object:

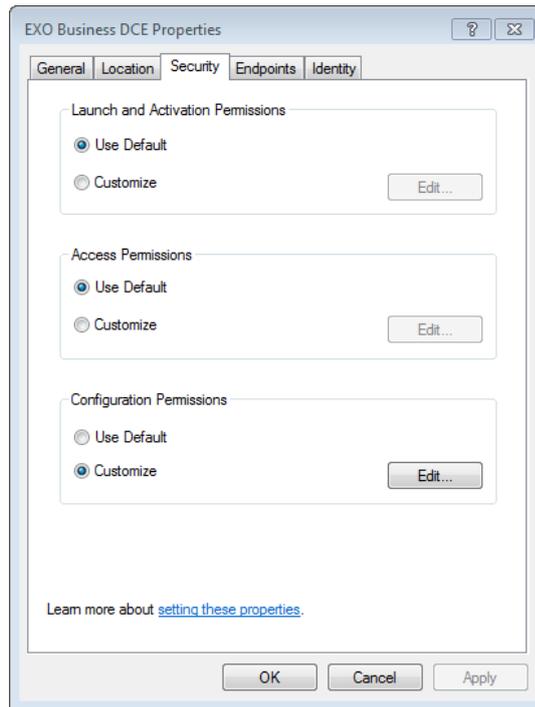
1. From the Windows Start menu, select **Run**, and enter **dcomcnfg**. The Component Services screen appears:



Note: The actual applications visible in the DCOMCnfg properties will depend on the applications installed on your server. Note the Exo Business DCE application in the list.

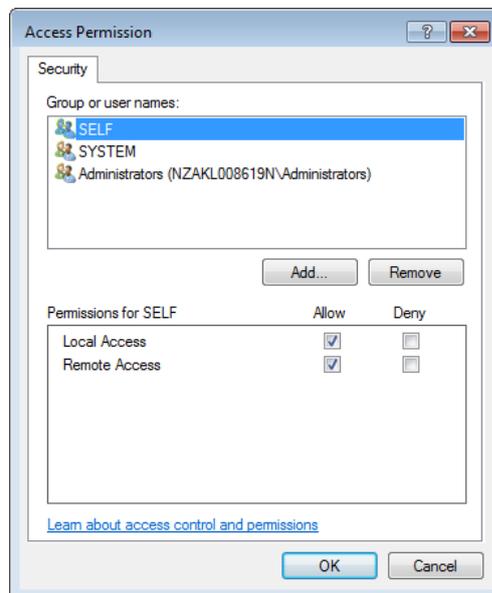
2. Open Component Services > My Computer > DCOM Config, right-click on the Exo Business DCE application and select Properties.

3. Select the Default Security tab.



Access permissions must be for the server DCOM objects so the client computers can access the middleware server. Launch and Configuration permissions should be left as default as they are not used when the Exo Business DCE is run as a service.

4. In the Access Permissions group, select **Customize** and click the **Edit...** button.



5. When the Access Permission window appears, click **Add...**

The user or group of users given access to the object will depend on the transfer protocol configuration used.

Service	User Name(s)	Local or Domain
Sockets	SYSTEM	Local
DCOM	Each user name requiring access, or the group name of the list of users requiring access	Domain
HTTP(S)	IUSR_[ComputerName] where ComputerName is the name of the computer running the Internet Server	Local

In some operating systems, the SYSTEM account should always be added when customising the access permissions. It is recommended this SYSTEM account be added by default regardless of the protocol selected.

6. Select the User or Group to add, and click OK. For example, add SYSTEM for Sockets, IUSR_name for HTTP, or the Group or Username for DCOM.
7. Ensure that the Allow is ticked for the access permissions for the user(s).
8. Click OK and close all windows.

Start the Services

If the Exo Business DCE and Socket services have not started, then they will need to start before Exo Business can connect to them. If the services are already running then they will need to be restarted to ensure alterations to the DCOM permissions are recognised.

Socket Service Activation

If sockets are being used, then:

1. Open the Windows Services Manager in Window's Administrative Tools.
2. Locate the 'Borland Socket Server'. Ensure the Startup Type is set to **Automatic**.
3. Right-click on the service, and select **Start**.

Exo Business DCE Service Activation

To start the Exo Business DCE service:

1. Open the Services manager from Window's Administrative Tools.
2. Locate the 'Exo Business DCE'. Ensure the Startup Type is set to **Automatic**.
3. Right-click on the service, and select **Start**.

The middleware server now has the software installed.

Dedicated IIS Servers and the Middleware (HTTP only)

It is possible to install the middleware on a different server to the Microsoft IIS server to 'interpret' the HTTP data, however the configuration differs in the following ways:

- The Exo Business DCE must be registered in the DCOM properties of the IIS server as well, but pointed to run on a 'remote' middleware computer. This may be done by running the Exo Business DCE on the IIS server once, but changing the DCOM location settings to run the application on the remote middleware computer
- The middleware server DCOM access permissions must be granted to the IUSER_iisServerName – the user name for IIS guests. With some operating systems the local user names of remote machines is not available, so it may require granting the access rights to EVERYONE – something that should be done with caution.

Using a separate IIS server should really only be considered if it is felt the IIS service is using too much middleware server performance, and the benefits of using a separate server would offset the expense of extra network communication between the two servers.

If an IIS server is already installed on the network performing other web services, it would normally be a recommendation that a separate IIS installation be used on the middleware server, dedicated to servicing the middleware. This would normally give the best performance, and allow easier management of these two functions.

Configuring the Exo Business DCE

Overview

This section covers the configuration of the middleware server, and the matching client configuration, for the various data transfer communication protocols.

Security Code Registration of the Exo Business DCE

The Exo Business DCE can be configured without entering the registration information, but the Exo Business DCE must be registered before actual connections to registered databases will be allowed. This includes testing connections during configuration – so really it is better to enter the registration codes before setting the up Exo Business DCE.

This requires running the Exo Business Config program against the database with a direct Database Connection, as per standard Exo Business configuration. Enter the registration codes as per normal Exo Business practice.

Note: The Exo Business DCE can be used on a demonstration database without registration.

Connections

Before covering the different connection types, the following terminology should be understood:

Database-level username and password

Refers to the username and password that is controlled by the database itself. This provides access control to the database, and is something the database must validate before the database will “connect”. All management of this password (changing passwords, expiry and so on) is managed by the database itself.

Application-level username and password

Refers to the username and password managed by the application (e.g. Exo Business). This is the username and password that the Exo Business user will use. Exo Business will manage the end user passwords (including changing passwords, expiry and so on). Exo Business in turn manages the communication to the database; the implementer sets up the Exo Business application with the database level password ‘behind the scenes’ during implementation.

Connection Information

A set of information required to connect to an application or database. This will probably include a username and password, information on the server being connected to (such as a server name or IP address).

For a middleware connection, this may also include the method of communication (such as Sockets or HTTP). A database connection will normally include the database name or path to the database.

Connection Name

A name used to reference a set of connection information.

Exo Business Connection Editor

Database and middleware connections are handled through the Exo Business Connection Editor. The Connection Editor should be familiar to those who have already used Exo Business; it is where direct database and middleware connections are created.

Note: You can access the Connection Editor by clicking Setup on the Exo Business DCE window. On later Windows Server operating systems, it is not possible to access this UI when ExonetDCE.exe is running as a service; however, you can run **ExonetDCE.exe -executable** from a command line to access the UI.

Direct Database Connections

To configure a client workstation with a standard two-tier Exo Business configuration (that is, with no Exo Business DCE), a direct Database Connection is used. This type of connection should be familiar with Exo Business implementers.

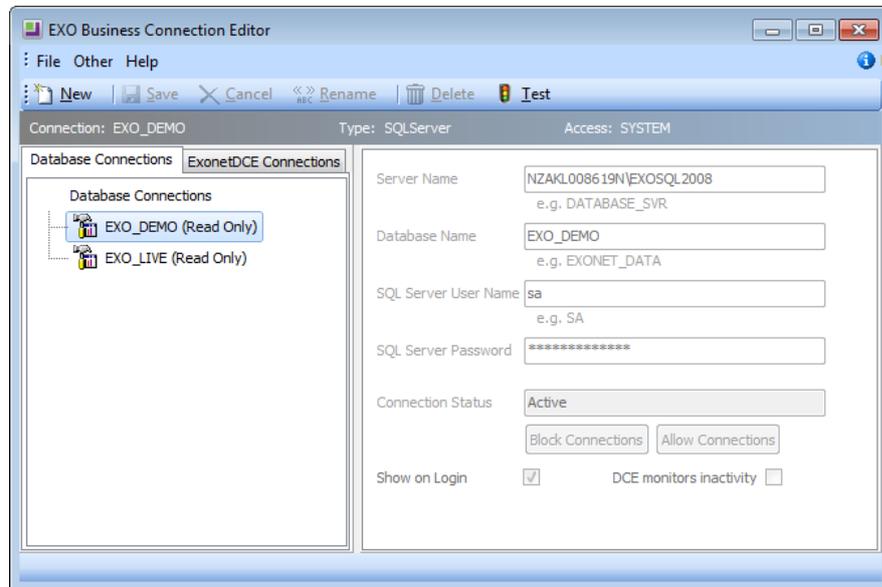
Database Connection Information

A new Database Connection is created with its own unique *connection name*. A database server name, *database-level* username and password are also entered to give the database *connection information*. Multiple Database Connections can be set up so a client can connect to multiple databases.

A Direct Connection requires an administrator enter the *database-level* password during initial installation at each client computer. This password is hidden and encrypted, and stored in the client computer, so the end user never needs to know or use this.

As well as giving the connection a name, the following fields are required:

- Server Name – the network name of the server (e.g. TESTSQL)
- Database Name – the name of the database on the SQL server
- SQL Server User Name – the *database-level* user name
- SQL Server Password – the matching *database-level* password



Direct Database Connection Process

When Exo Business is run on the client computer with a Database Connection:

- On starting, the Exo Business client will prompt the user for a connection name, and Exo Business *application-level* username and password.
- Exo Business will then look up the connection name set up locally in the registry of the client computer, and obtain the hidden and encrypted *database-level connection information*.
- Behind the scenes, Exo Business will decrypt and use this *database-level connection information* to gain access to the database server.
- From the database, Exo Business will match and validate the Exo Business *application-level* username and password provided by the end user/ client against that stored in the database, and if all successful, Exo Business will begin. If not, connection will be refused.

Exo Business DCE Connections

To configure an n-tier Exo Business DCE connection, an Exo Business DCE Connection is used on the client workstation to connect to the middleware server. As the middleware server must then communicate with the database server, a direct Database Connection is used by the middleware to connect directly to the database.

So, the client computer needs to be set up with the *connection information* of the middleware server. And the middleware server must be set up with the *connection information* of the database server.

On the middleware server, a direct Database Connection is used to give the middleware access to the database. This is set up in exactly the same way as a client in the two-tier configuration, including a *database-level* username and password. However, the key point to note is the Connection name – this is what the clients will use in their configuration

On the client workstation, an Exo Business DCE Connection is created, specifying the connection name just created on the middleware, as well as the information to locate the middleware and communication method (such as sockets). Note there is no database password information specified on the client computer – just the server connection and location information.

Again, multiple Exo Business DCE Connections can be set up so a client can connect to multiple databases.

Common Exo Business DCE Connection Information

The process for entering an Exo Business DCE Connection is similar to a Database Connection.

There are three common Exo Business DCE Connection settings regardless of communication type – the Connection Name, Packet Records, and Client Side Caching

Connection Name

The Connection Name specified in the client's Exo Business DCE Connection is the 'link' between the client's connections and the middleware's connections. This is the name of the direct Database Connection that will be set up on the middleware server that the middleware will use to connect to the database.

For example, if a direct Database Connection called TESTDCE is set up on the middleware to point to the company database, then when setting up the client Exo Business DCE connection TESTDCE should be entered as the connection name.

Packet Records

The Packet Records setting affects how much data is returned to the Exo Business client from the Exo Business DCE on a database query.

For example, a table contains 1000 records. If a request is made to return all records in the table, but only 50 are required to be displayed on a screen, then returning 1000 records would cause unnecessary traffic on a low bandwidth connection. Setting a packet size of 100 would return a more appropriate amount. If more data is needed, for example, scrolling down the search window, the additional data is transferred from the Exo Business DCE. This can make the end user performance appear faster on initial loading, rather than having to wait while the entire data set is returned.

Examples:

Packet Records = 100 Sets the record size to 100

Packet Records = -1 Returns the entire record set

Packet Records = [blank] Returns the entire record set

Client Side Caching

Enabling Client Side Caching causes Exo Business to pre-load some database tables on start-up, and hold them locally in the client's memory. The cached tables are defined within Exo Business in the Exo BUSINESS_CACHE_TABLES table, and include regularly referenced tables whose contents rarely change, e.g. period names, currencies.

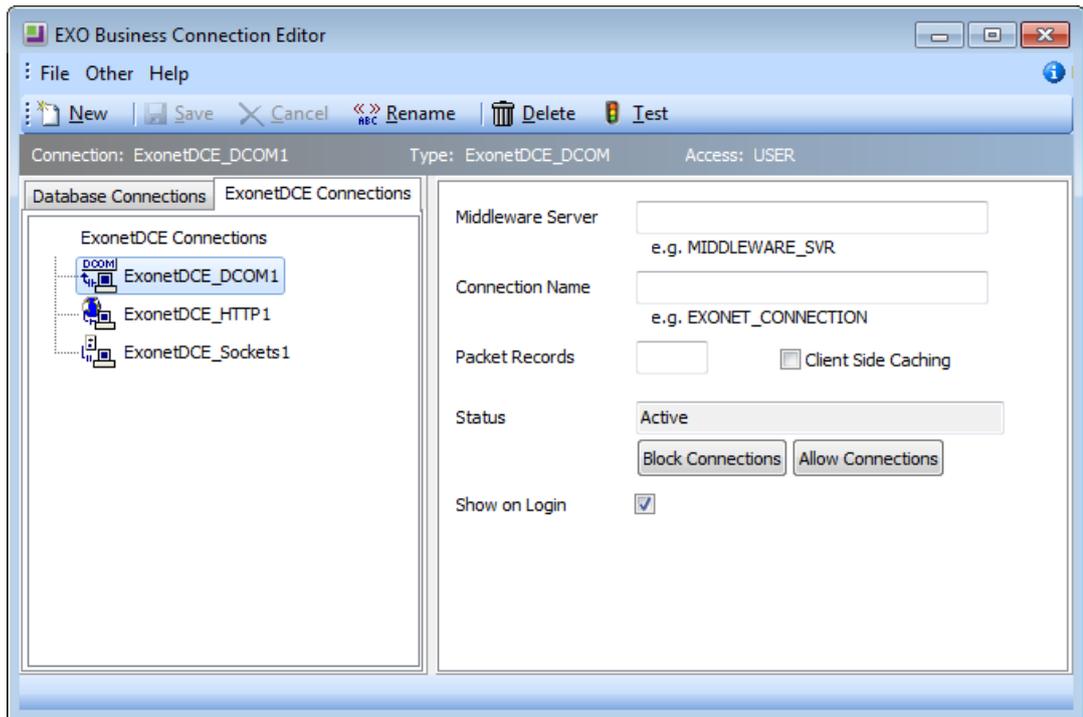
This would normally be enabled on lower speed connections, and only normally be disabled for diagnostic purposes.

See also "Cached Tables Tuning" on page 35 for more information on configuring the Exo BUSINESS_CACHE_TABLE table.

Protocol Specific Information

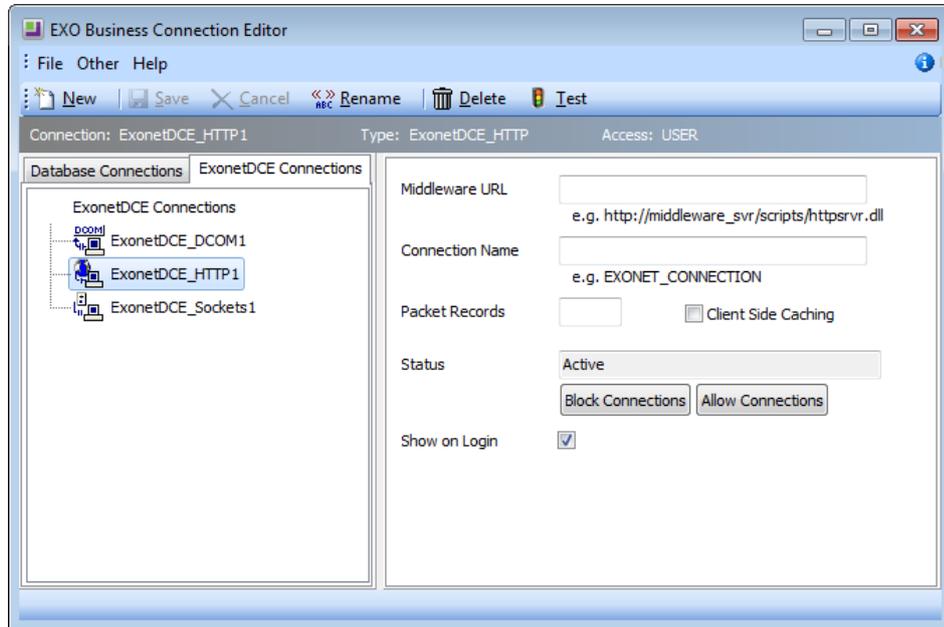
DCE_DCOM Connections – Middleware Server

The Middleware Server is the network name of the middleware server, e.g. TESTMID



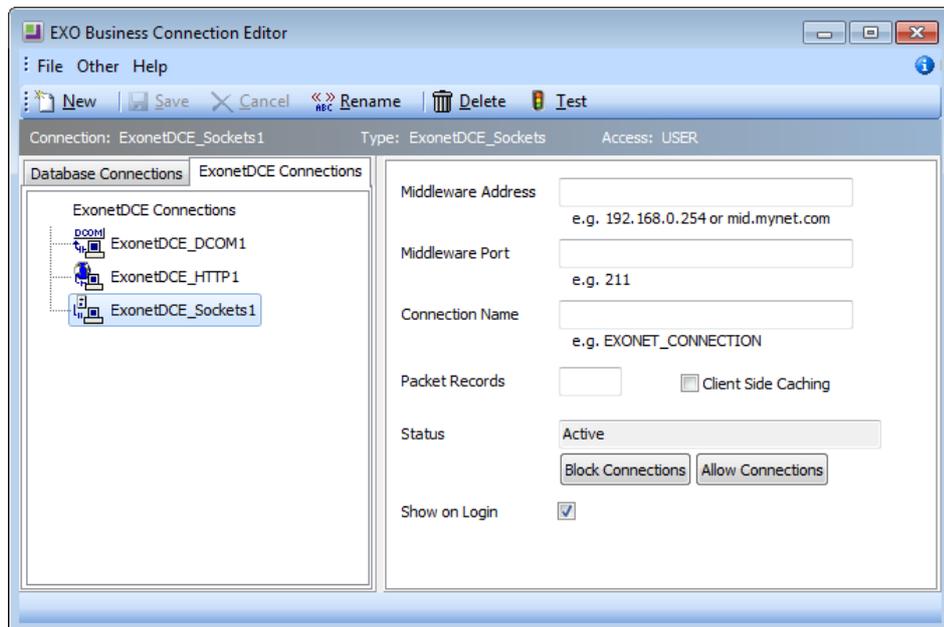
DCE_HTTP Connections - Middleware URL

The Middleware URL is the full URL address of the middleware server. This includes the path and name of the HTTP application that was specified when configuring the IIS server, e.g. `http://TESTMID/scripts/httpsrvr.dll`



DCE_SOCKETS Connections – Middleware IP Address/ Port

The Middleware IP address is the network IP address of the middleware server (e.g. 10.0.0.27). The port is the data port that the socket information is sent on. By default this is port 211, but could be altered for firewall purposes.



Note: A Sockets connection requires the IP address of the computer to be specified. This means the computer must have a fixed IP address; a DHCP server cannot assign it on startup, or the address may change after a restart and the server may not be found.

Exo Business DCE Connection Process

When Exo Business is run on the client computer with a DCE Connection:

1. The Exo Business client will prompt the user for a *connection name*, and Exo Business *application-level* username and password,
2. The Exo Business client will look up the connection name set up locally on the client computer, and obtain the middleware server name and communication method
3. The Exo Business client will then locate the middleware server, and pass it the connection name, Exo Business application-level username and password
4. The middleware will match up the connection name from the client to a local Direct Connection
5. This local Database Connection information allows the middleware to locate the database server, connect to the database using the *database-level* password only known to the middleware server
6. The middleware will then validate the Exo Business *application-level* username password provided by the end user/ client, and if all successful, Exo Business will begin. If not, connection will be refused.

Example N-tier Configuration

As an example, the following will:

- configure connections on a middleware server called **TESTMID**, with a fixed IP address of **10.0.0.10**
- that is running Sockets on the default port of 211
- to connect to a SQL Server instance called **EXOSQL**
- on a SQL Server called **TESTSQL**
- with a database called **TESTDATA**
- using a common connection name of **TESTDCE**
- assuming the default SQL Server username of **sa** and password of **\$ExoAdmin7000**
- using the default Exo Business application-level account of **ExoAdmin**, password **ExoAdmin**

Note: To check the IP address of your server, you should check the TCP/IP setting from the computer's Network Properties. Care must be exercised with DHCP, to ensure the IP address does not change on a server reboot. A fixed IP address is normally the preferred option. To confirm an IP address, from a command prompt type IPCONFIG.

Preparation

The following example will assume:

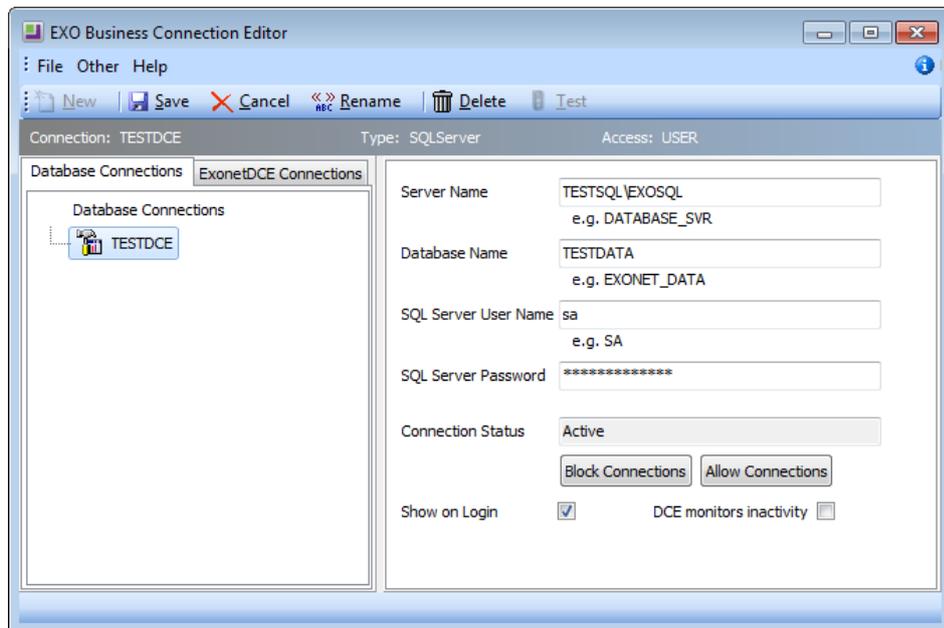
- a SQL Server named TESTSQL is set up, with the database of TESTDATA.
- the middleware (with a server name of TESTMID and a fixed IP address of 10.0.0.10) has been configured as in the previous chapter, and as a minimum has Sockets installed.
- Exo Business is installed on the client workstation.

Note: It would be beneficial at this stage to test the client and database operation by creating a direct Database Connection on the workstation, and confirm the system operation.

Configuring the Middleware Server

To configure the middleware, a direct Database Connection must be created on the middleware server, as follows:

1. If the Exo Business DCE is not currently open, right-click on the Exo Business DCE icon in the middleware server's system tray, and select **Setup Connections**.
2. Click **New**, then select a new SQL Server connection, entering:
 - Server Name – TESTSQL\EXOSQL
 - Database Name – TESTDATA
 - User Name – sa
 - Password – \$ExoAdmin7000
3. Click the **Save** button to save the connection.
4. Click the **Rename** button, and rename the connection to TESTDCE. This will be the middleware connection name the client will refer to.



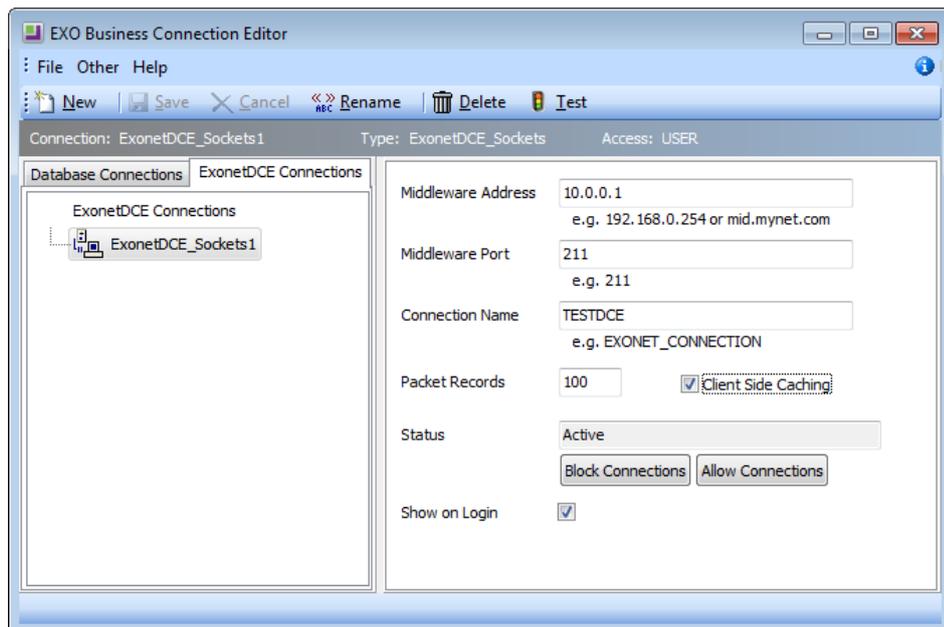
5. Click the **Test** button. This will open up the database test procedure.
6. Confirm the connection name is TESTDCE, and enter in the application user name and password of ExoAdmin. Click the **Test** button, and confirm the database connection is successful.

The Exo Business DCE middleware server is now configured and tested.

Configuring the Client

On the client workstation, an Exo Business DCE Connection must be created. This example will use a Sockets connection.

1. Start Exo Business on the client, and select the Setup Connections option in the login window.
2. Click **New** and create an ExonetDCE_Sockets connection, entering:
 - Middleware Server IP address – 10.0.0.10
 - Middleware Port – 211
 - Connection Name –TESTDCE
 - Packet size – 100
 - Client Side Caching - enabled
3. Click the **Save** button to save the connection
4. Click the **Rename** button, and rename the connection to MYTEST. This will be the connection name the Exo Business user will select on startup.



5. Click the **Test** button. This will open up the database test procedure.
6. Confirm the connection name is MYTEST, and enter in the application user name and password of ExoAdmin. Click the **Test** button, and confirm the database connection through the Exo Business DCE is successful.

The configuration and testing of the Exo Business DCE connection is now complete.

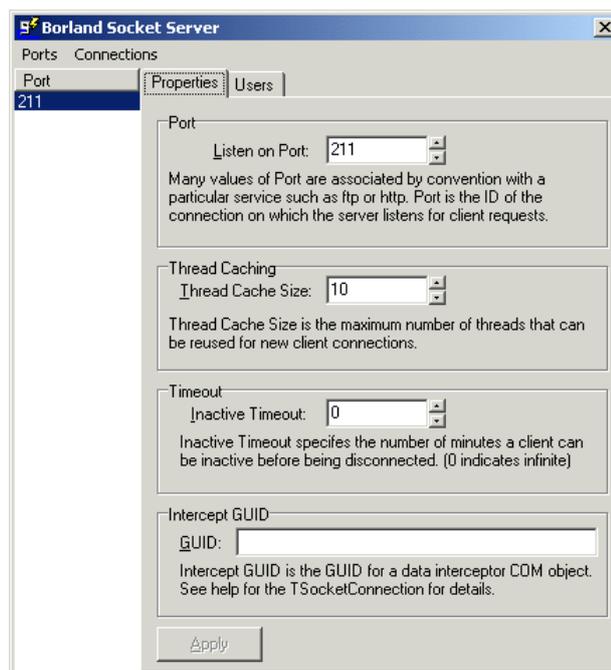
7. Close the Exo Business Connection Editor.
8. Select the MYTEST connection, and enter in the application user name ExoAdmin and the password ExoAdmin.
9. Confirm Exo Business starts up successfully.

You have now configured and tested and used an Exo Business DCE connection. As another test, try setting up and testing a DCOM client connection, than an HTTP client connection.

Borland Socket Server Configuration

Normally the default settings of the Borland Socket Server will suit most applications. However it is possible to alter some settings, and view user information.

Once activated, the Borland Socket Server should appear in the server's application tray in the Windows task bar. Opening the Socket Server will allow the configuration to be viewed.



Note: On newer Windows Server operating systems, the system tray icon does not appear. To access the configuration window in these cases, stop the service and run socketsrv.exe from a command line. Close the configuration window and restart the service once the changes have been made.

Note the default socket port number of 211. This should match the number entered in any Exo Business client connection configuration. This port should also be open on any firewalls in the network path. Clicking the Users tab will allow viewing of connection information, including the users IP address.

Cached Tables Tuning

As mentioned in the Common Exo Business DCE Connection Information section on page 27, client side caching can be used to cache commonly referenced tables locally on the client during start-up. The contents of these tables should rarely change during normal Exo Business use, as the cache is not refreshed until the application is restarted on the client, even if the contents of the source tables are altered.

The Exo BUSINESS_CACHED_TABLES table specifies which tables are to be cached. This table consists of two fields; AppId and Tablename. AppId is the application ID as used in the Exo Business MODULE_SECURITY table, e.g. Exo Business AppId = 1, Job Costing AppId=300. Setting an AppId = -1 will cause all Exo Business applications to cache the specified table.

Query Analysis

Query performance can be monitored using the MS SQL analysis tools. Look for queries that reference tables that are static, and can therefore be optimised by putting the table name in the Exo BUSINESS_CACHED_TABLES table.

If a low speed connection is being used, then the hourglass cursor on the client can be used as a clue for areas to monitor

If the hourglass flashes during user actions, note the number of times the hourglass flashes as each flash normally indicates an individual query. A large number of flashes per function indicates that the query should ideally be optimised, so analyse this query with the appropriate SQL tools.

A stable hourglass for a longer period between flashes indicates a larger dataset query is being returned. In this instance it may be that the packet records filter should be used, or the query should be analysed to see if it could be made more efficient.

This 'hourglass analysis' is not normally possible on high-speed connections as the hourglass flashes too quickly.

Extra Fields

The most common area of cache tuning for a specific site is around extra fields using lookup tables. If lookup tables have been added to Exo Business and used in extra fields, and the content of these tables are static, then these tables should be added to the Exo BUSINESS_CACHED_TABLES table.

Care should be taken when using lookup tables if the lookup table size is large, or if the table is dynamically altered. For instance, adding the main DR_ACCS table as a cross-reference lookup field on debtor accounts extra fields will most likely result in a large, slow query that cannot be cached due to its dynamic nature.

Additional Profile Settings to Consider

Prompt Computer Profile when application startup – A user profile setting, which if enabled will cause Exo Business applications to prompt with a computer profile selection screen during login, allowing the user to select their computer profile. This is useful for example when moving a notebook computer between office and home, allowing different computer profiles to access different resources, e.g. printers or files.

Use default profiles – If enabled, client applications will use the default user, computer and site profiles. This prevents a prompt from appearing on a new computer, asking them to select a computer profile.

Computer identification method – Select a method of how a computer id is stored and identified for computer profile selection – GUID, ComputerName, ClientName, ComputerName + ClientName. This may require some care in a multi-platform environment.

Additional Features

Overview

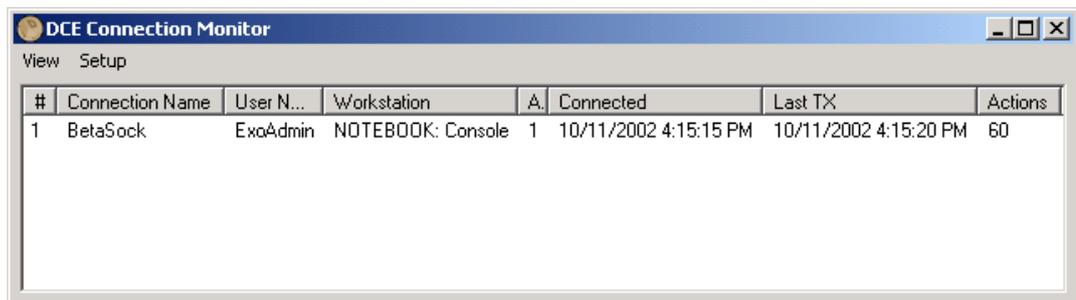
This chapter explains the additional features and functions of the Exo Business DCE, including diagnostic functions.

Monitoring Connections

When the Exo Business DCE is in use, it is often useful to know who is connected, and when the connection was last used.

The Monitor Connections function within the Exo Business DCE is used to monitor actual connections through the Exo Business DCE. This provides information on the user's name, workstation network name, time connected and so on.

This would often be used in conjunction with the databases own connection information tools, which would show active connection through both the Exo Business DCE and any direct connections. However, normally the database will only show the common database-level user name, which will be used by all Exo Business users "behind the scenes". The Exo Business DCE monitor will often be more useful in knowing who is connected, and is another advantage of using the Exo Business DCE.



The screenshot shows a window titled "DCE Connection Monitor" with a menu bar containing "View" and "Setup". Below the menu bar is a table with the following data:

#	Connection Name	User N...	Workstation	A.	Connected	Last TX	Actions
1	BetaSock	ExoAdmin	NOTEBOOK: Console	1	10/11/2002 4:15:15 PM	10/11/2002 4:15:20 PM	60

Automatic Disconnection

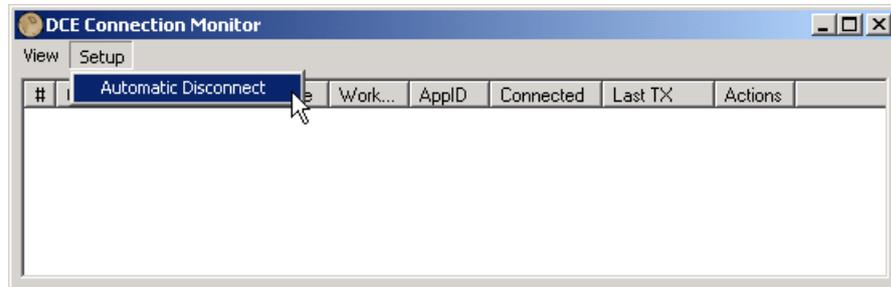
In a DCE connection, the network 'link' between the client and the middleware is quite 'loose' – the connection passes from the client, across the internet, through IIS, and finally to the middleware. If the client disconnects 'ungracefully' then the middleware server is not always made aware of this, and it will hold the connection open.

This can mean that connections are left open on the middleware server, holding up database connections and licences.

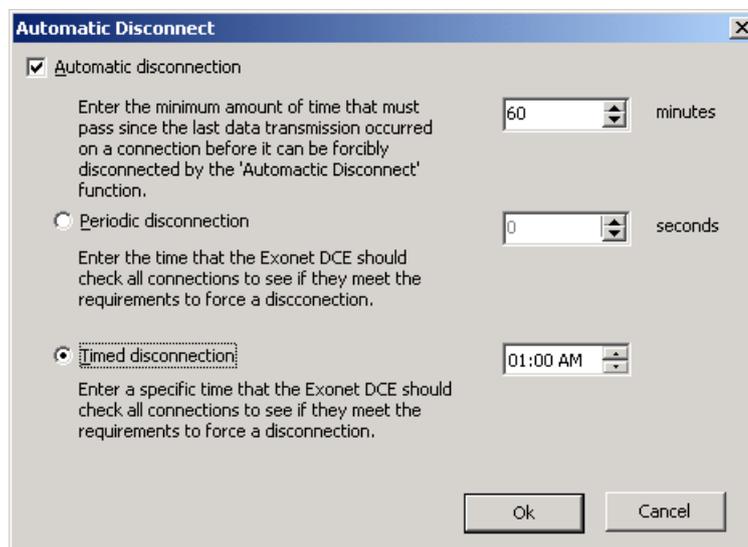
Similarly, a user may log in to an application and stay logged in, even if they are not actually using the system. If the connection count is at the maximum, this can prevent other users from logging in and stop the site making efficient use of concurrent licensing.

To manage this, the Exo Business DCE has an option to forcibly disconnect a user after a defined period of inactivity (time since the last transmission, derived from Last TX on the connection monitor). This automatic disconnection is configured as follows:

1. Select Setup >Automatic Disconnect from the DCE Connection Monitor.



2. The Automatic Disconnect setup screen will appear. To enable automatic disconnection select the Automatic disconnection check box.



3. Enter the period of time that a connection must be inactive before it will be available to disconnect, and select whether to check the connections periodically or at a preset time.

For example, if the site wants to manage the concurrent user count 'tightly', then set the amount of time that must pass before a connection is deemed 'inactive' to 60 minutes, and select periodic disconnection for a time of say 60 seconds. The DCE will then check every minute for connections that have been inactive for more than 1 hour.

If the site wants to make sure that each night the system starts 'clean' because no one operates overnight, then set the inactivity time to say 120 minutes, and select Timed Disconnect with a time of 2am. At 2am the DCE will disconnect any users who have been inactive for over two hours.

Troubleshooting

This chapter will provide guidance on troubleshooting the Exo Business DCE.

Note: Different server settings, protocols used and previous software installs can make isolating individual solutions to specific errors difficult. If the following help on a specific item or error doesn't resolve the issue, please check suggestions for other errors, or completely remove the installation and retry setting up again from scratch.

General Connection Errors

'Access Violations', 'Object not found', library or .dll errors, or other unusual errors can occur when connecting through the Exo Business DCE. (In some installations, a test connection will pass, but an actual connection through the client will fail).

This may be due to having Exonetlib.dll registered on the server (which may happen automatically when running Exo Business on server), by having old versions of Midas.dll installed on the server, or by not having Midas.dll installed on the server at all.

Note: Having a version of Exonetlib.dll registered on the server is the most common problem with initial Exo Business DCE installations. Always check the registry for Exonetlib.dll if there are any problems in the initial installation. This is the most common cause of errors in an Exo Business DCE installation

Exonetlib.dll is used on clients that connect directly to the database, and not used on an Exo Business DCE middleware server. To check if Exonetlib.dll is a cause of problems:

- Check Exonetlib.dll is not registered on the server
- Remove any copies of Exonetlib.dll from the middleware server to be safe.
- Re-check server permissions. Have any rights restrictions been put on the network and/ or server?

Checking for Exonetlib.dll

To check if Exonetlib.dll is registered, the registry should be scanned for references to Exonetlib.dll. To check the registry:

1. Run REGEDIT
2. Using the Find function, search for 'Exonetlib.dll'.

If reference to the Exonetlib.dll is found in the 'HKEY_CLASSES_ROOT\CLSID\{E319973...}' key, with a branch 'InprocServer32', then Exonetlib.dll has been registered on the server. Note the path that the Exonetlib.dll file is loaded from; this is normally c:\winnt\system32, but could be another directory.

Exonetlib.dll may be found but installed against another directory. This can be caused by running Exo Business.exe locally on the server with a copy of Exonetlib.dll located in the same directory. Windows will search for a DLL in the local directory if one is not registered and if found will self-register it. For these reasons it is recommended that

Exonetlib.dll never be copied onto the server. (This is also why the Exonetlib.dll file is stored in a separate 'components' subdirectory on the installation CD). Alternatively Exonetlib.dll may have been automatically installed if the client installation was done using the installation CD.

Removing Exonetlib.dll

If the Exonetlib.dll has been previous installed on the middleware server, then the .dll should be unregistered. From Windows Start/ Run enter:

```
'regsvr32 c:\winnt\system32\Exonetlib.dll /u'
```

Note that this assumes the Exonetlib.dll file was registered against the c:\winnt\system32 directory. If it was found against another directory as detailed above, then that path should be specified.

To uninstall the Exo Business DCE service, ensure the service is stopped, and from Windows Start/ Run enter:

```
'c:\winnt\system32\Exo Businessdce -uninstall'
```

Once this is done, the registry should be rescanned to check the file has been successfully removed. (Note, reference to the file may be found in other registry keys, such as command line history keys. These entries can normally be ignored).

If there are still suspected issues, then the Exo Business DCE or Exonetlib.dll file can be manually removed from the registry. It is strongly recommended that this only be done by users who are familiar with editing the registry. The registry should be backed up.

1. Run REGEDIT
2. Export the registry, or perform some other backup process
3. Search for the application GUID of 'E319973F-A2CA-4555-8BC1-2795CE4CE799', using the registry editor find function.

(Searching for 'E319973F', and then checking that any results are the correct full GUID is easier than entering the entire key).

4. Remove any registry entries referring to this key.

Restarting the computer is recommended to remove any memory resident versions, and ensure changes are recognised. It is also recommended that the server hard drive be searched for any copies of Exonetlib.dll, and these files be deleted.

Reinstalling the Exo Business DCE Service

The Exo Business DCE service should then be reinstalled to recreate the registry entries. To install the Exo Business DCE service, from Windows Start/ Run enter:

```
'c:\winnt\system32\ExonetDCE -install'
```

Midas.dll Versions

Another cause of general connection issues is midas.dll on the server - or lack of it.

- Scan the registry to check the Midas.dll file location
- Ensure the latest version is installed (current version is dated 5/2001 at the time of this document creation).
- Make sure Midas.dll is only in one place. The c:\winnt\system32 directory or equivalent is recommended as this directory will not move or be deleted.

To check if midas.dll is registered, the registry should be scanned for references to midas.dll. To check the registry:

5. Run REGEDIT
6. Using the find function, search for 'midas.dll'.

Check the directory that midas.dll is being referenced to, and then using Windows Explorer confirm that the date is correct. Note that Midas may be referenced numerous times in the registry and these paths should be checked.

To be safe, scan the hard drive and remove all other versions and copies of Midas.dll.

Debugging an Exo Business DCE Connection

As with any debugging, it is always good practice to strip the system down to the bare minimum and test each part.

- Can the database be connected to directly – with the test connection function, or through an ODBC connection with Excel?
- Can Exo Business connect to the system without the Exo Business DCE? That is, does a local Exo Business Database Connection connect, bypassing the Exo Business DCE?
- If the system does connect directly (not via the Exo Business DCE), then recheck all settings in the configuration settings of the client computer and the server.
- If using HTTP, try a different connection type such as Sockets, or vice-versa.
- If installing on a server that has been used for other things, try installing on a “clean” computer – preferably a fresh install, in case another application has previously modified the system settings.

General 'Database Type' Errors

If a connection fails with a standard database-level error, check database connectivity – including rechecking the obvious.

- Double-check the connection name, user name and so on, particularly pathnames on the Exo Business DCE Connection Editor, and on the client computer. It is surprising how many bad connections are caused by typographical errors.
- Check a direct Database Connection can be done on the middleware server using the connection Test function. If the Exo Business DCE cannot connect directly to the database, neither will a client through the Exo Business DCE.
- Test a client using a Database Connection; bypassing the Exo Business DCE will check that the database is working elsewhere on the network.
- Ensure the database client files are installed on the middleware server – MDAC for Microsoft SQL Server.
- Try connecting through another method, such as an ODBC connection. Ensure the latest Microsoft Data Access Components are installed depending on the operating system being used.
- It is possible to get 'Unable to establish a database connection' errors through other configuration issues. Refer to the "Specific Connection Errors" section on page 43.

Refused Connections

Connections may be refused after 1 or 10 connections (for example). The usual cause will be licensing enforcement – Windows, database or Exo Business.

- Is a Windows server or workstation operating system being used for the middleware server? Workstation limits the number of different IP addresses connecting to the workstation to 10. Of course a server-level operating system is required for a live installation.
- Ensure sufficient client licences for the operating system and database.
- If the error is insufficient Exo Business DCE licences, ensure that the Exo Business DCE is registered using Exo Business Config. Exo Business Config should always be able to connect regardless of Exo Business licensing enforcement, to allow licensing to be configured remotely. Licensing can also be checked at a local database level by viewing the Module_Security table directly using database tools.
- If the Exo Business DCE licence settings are correct, check the Online_Security database table to ensure only active and valid connections are being monitored. These may be invalid if users do not exit correctly, and do not log back in at a later date.

HTTP Connections Not Working

If other connection types (e.g. Sockets) are operating correctly, then most issues will point to the web server.

- Try copying the entire middleware URL and pasting it into the clients web browser to see if it returns a blank page (successful finding of the .dll), or an error.
- Try accessing an .HTML file on the web server from the client. This may require creating a temporary .HTML file, and placing on the web server.
- See also “Specific Connection Errors” below.

Specific Connection Errors

‘A connection with the server could not be established’

Normally associated in this instance with the Web Server and HTTP connections.

Check the Internet Admin service has been started.

Check the World Wide Web Publishing service has been started.

Create a test web page on the IIS server, and ensure that the client computer can view the test web page.

Stop and restart IIS, including the IIS Admin service and World Wide Web Publishing service, to ensure changes are reflected.

Unable to establish a database connection. There was an error connecting to the database server: unavailable database’

This is a different error to the ‘general database-type’ errors, and can be caused by the service properties being different to the default.

Check the properties of the Exo Business DCE service. (Services manager, right-click on the Exo Business DCE service, and select Properties). Ensure the ‘Log On’ properties are set to the local system account, with ‘Allow service to interact with the desktop’ selected. The service must be stopped and restarted to reflect the changes.

‘Insufficient licences’

License restrictions are being invoked. It is important to check which licence system is enforcing the restriction; the database, operation system and Exo Business DCE can all limit the number of connecting used. See also the ‘General Connection Errors’ section for more details.

‘Class not found’

Ensure that all necessary registry settings have been set up (see page 19) and reboot before starting the Windows service.

‘Failed to load type library’

Check that midas.dll is registered on the server.

'Invalid Connection Name. Unable to find database connection named xxxxx'

- This error can be as obvious as the client machine not pointing to the correct location, or more obscure such as the Exo Business DCE service not operating correctly.
- Check the connection name in the client machine's 'Exo Business DCE connections – Connection Name' matches the name used in the Exo Business DCE server's 'Database Connections' setup.
- Check the Exo Business DCE service exists, and has started successfully. Uninstall and reinstall the Exo Business DCE service if necessary.

'The object invoked has disconnected from its client'

This message will appear on a client computer when the connection to the server has been lost. This may occur because the Exo Business DCE has terminated a connection because of inactivity, or a network error that has dropped the connection.

'Object not available {E319973F.....}'

This is generally a result of the Exo Business DCE service not being installed correctly, or the service has been partially removed after direct registry entry.

Reinstall the Exo Business DCE using the '-install' command.

'Method not allowed (405)'

A web service error normally caused by access being denied to the Httpsivr.dll (through the configuration of the IIS Server Manager), or the inability to find the file (through the middleware URL being incorrect or pointing to an invalid location).

- Double-check the spelling of the middleware URL. Is the server name or IP address correct, and the path to the httpsivr.dll correct?
- Ensure 'Read' access is given to the scripts directory, and 'Execute' permissions are set to 'Scripts and Executables'. Recheck the properties in the Internet Services Managers, as per "HTTP ISAPI DLL Installation (HTTP only)" on page 20.
- Ensure at a server directory level that file/ directory permissions have not restricted access.
- Check the basics of IIS servicing web pages (see 'A connection with the server could not be established' above).

'The operation timed out'

'Server Error (500)'

General errors when a web server cannot be located.

- Double-check the spelling of the middleware URL. Is the server name or IP address correct?
- If an HTTP connection, is the path to the httpsivr.dll correct? Is the IIS server running correctly? Try copying the entire middleware URL and pasting it into the clients web browser to see if it returns a blank page (successful finding of the .dll), or an error.

'RPC Server is unavailable'

If using DCOM connections, check the IP address of the remote server. Otherwise the message appears on the client computer, it usually indicates the Exo Business DCE connection has been lost, or the Exo Business DCE service has restarted. Exit out the client application and retry.

'The selected connection is not valid for this application...'

Even through the connection editor looks the same in both the Exo Business DCE and the Exo Business.exe client, ensure you are not running the Exo Business DCE on the client when testing a DCE connection. Effectively the Exo Business DCE will be trying to test a connection to itself, and the error will occur. Only test a connection to the Exo Business DCE with the actual Exo Business.exe application running on a client workstation.

'The service did not respond to the start or control request in a timely fashion'

The service has not started up automatically. Check the permissions of the service.

- Check the properties of the Exo Business DCE service. (Services manager, right-click on the Exo Business DCE service, and select Properties). Ensure the 'Log On' properties are set to the local system account, with 'Allow service to interact with the desktop' selected. The service must be restarted to reflect the changes.
- If the service will not start successfully, and error messages do not give an indication as to why, check the Windows event log for any errors that may show why the service failed to start.

'Windows Socket error (10061) on API 'Connect''

Generally, an issue related to the socket server and/ or the associated socket port.

- Ensure the socket service is running, and starting automatically. If the service will not start successfully, and error messages do not give an indication as to why, also check the Windows event log for any errors to help show why the service failed to start.
- Check the setting of the socket port in the client Connection Editor, and socket server. Normally port 211 is used by default.
- Ensure the network or firewall is not blocking port 211.

Other Q & A

DCE connections are slow, what can I check?

- Always try and do a direct connection (such as a direct modem RAS dialup), to eliminate things like firewall delays, VPN, Internet or other network traffic delays, or of provider delays.
- If it is on a LAN, try other direct connections (such as bypassing the Exo Business DCE). Otherwise check general server loading – disk paging, CPU, memory usage, and similar.
- If Extra Fields are being used, and these are static tables, then consider adding them to the Exo Business_Cache_Tables table. This stores a list of tables that Exo Business will load and cache at start up, if the 'Client Side Caching' is enabled on the client Exo Business DCE connection editor. This Exo Business_Cache_Tables table consists of two columns; the AppID – which is the match of the Application ID in the Module_Security table (with -1 being all modules), and the table name. See Cached Tables Tuning on page 34 for more details.

How do I remove the Exo Business DCE and start again?

To uninstall the Exo Business DCE service, from the Start/Run enter:

```
'c:\winnt\system32\ExoNetDCE.exe -uninstall'
```

If the Exonetlib.dll has been installed on the computer using the client installation CD, then the .dll should be unregistered. From the Start/Run enter:

```
'regsvr32 c:\winnt\system32\Exonetlib.dll /u'
```

If there are still suspected issues, then the Exo Business DCE or Exonetlib.dll file can be manually removed from the registry. It is strongly recommended that only users who are familiar with editing the registry perform this process.

1. Run REGEDIT.
2. Export the registry, or perform some other backup process.
3. Search for the application GUID of 'E319973F-A2CA-4555-8BC1-2795CE4CE799', using the registry editor find function. Remove registry entries referring to this key.
(Searching for 'E319973F', and then checking that any results are the correct full GUID is easier than entering the entire key).
4. Search for the 'Exo Business DCE' and 'Exo BusinessDCE', using the registry editor 'find' function. Remove any registry entries referring to this key.

Note: References to the filename may be found in other registry keys, such as command line history files for the Windows shell. These can normally be ignored.

Restarting the computer is recommended to remove any memory resident versions, and ensure configuration changes are recognised.

Glossary

This glossary defines the technical terms and concepts related to the Exo Business DCE.

Application-level username and password

Refers to the application (e.g. Exo Business) controlling the access, and manages the validation and changing of the username and password.

Database-level username and password

Refers to the database management system controlling the access, and manages the validation and changing of the username and password.

Connection Name

A name that points to connection information.

Connection Information

Encompasses information required to connect, possibly including the server name, database name or path to the database, username and password.

DCOM

The Distributed Component Object Model (DCOM) is a protocol that enables software components to communicate directly over a network in a reliable, secure, and efficient manner. Previously called "Network OLE". The Exo Business DCE can optionally communicate via DCOM.

HTTP/ HTTPS

Hypertext Transfer Protocol (HTTPS – Secure HTTP)

An application protocol that covers the transfer of files, used extensively in the Internet environment. The Exo Business DCE can optionally communicate via HTTP and HTTPS when used in conjunction with Microsoft IIS.

n-tier

A software development method that allows load spreading of database driven applications, to allow for more efficient data handling and scalability. Used in the Exo Business DCE to provide the most efficient and scalable data transmission methods.

RAS

Remote Access Service. Allows computers to make network connections over telephone lines. Note Windows 95 requires updates to Dial Up Networking and Dial Up Server to support these services.