
Data Synchronization for Sales Automation

Key Criteria for Evaluating Sales Automation Software



Data Synchronization - Critical Technology for Sales Automation Success

Recent advances in portable computing, and restructuring of sales organizations, have created new challenges for database systems. Laptop computers are now an important tool for mobile salespeople, but they operate largely disconnected from corporate data processing systems. Companies that are managing important customer and sales information are beginning to distribute some of this valuable information to field salespeople to help them close sales faster.

*One of the most critical technical issues
in sales automation today is the synchronization of data
between host corporate systems and remote users.*

Data synchronization allows remote salespeople to access up-to-date corporate data on their “disconnected” computers. Salespeople in the field can maintain a subset of the master database and update their local data while others are working with the same data simultaneously. Synchronization also allows corporate managers and “sales teams” to share information created by field salespeople, such as meeting notes, schedules and forecasts.

Key trends in selling make data synchronization even more important:

- Salespeople are spending more time out of the office with customers and prospects. Many salespeople are “telecommuting” – working out of their homes rather than corporate branch offices.
- Salespeople operate as members of “selling teams” as products become more complex and technical, so the need for sharing information grows.
- Entire sales and marketing organizations are using computer-based customer, sales and project information to sell more effectively. Field salespeople can leverage this information to close sales faster and managers can access information input in the field.

While most sales automation systems offer synchronization capabilities, there is wide variation of capabilities and quality between systems. This is more than a simple checklist item. *The synchronization systems should be a primary part of any sales automation software evaluation.*

What are the Steps of the Synchronization Process?

Field salespeople with laptop computers need to download a pertinent subset of data, manipulate and update the data, and reconcile their changes with the new information from the host database. The typical process of synchronizing data between remote and host systems requires several basic steps, as illustrated (Figure 1) and outlined below.

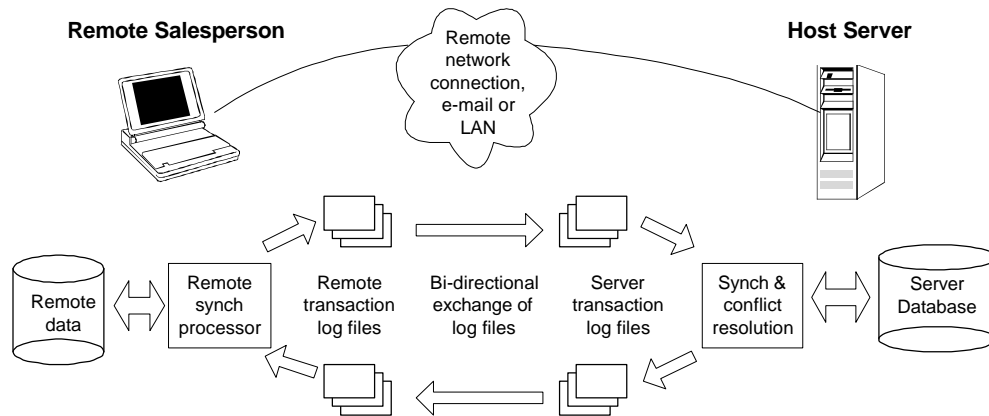


Figure 1: Data synchronization requires a bi-directional exchange of data between host systems and remote users. The server system should support multiple remote connections at the same time.

1. Remote databases are created for mobile salespeople and branch offices. Each database is a relevant *subset* of the corporate database. For example, the information on a field salesperson's laptop need only pertain to their territory.
2. Since different copies of corporate data now exist and are being updated at the same time, the synchronization system *tracks changes and updates* to both the remote databases and the host database. These changes, or transactions, are stored in *log files*.
3. Remote salespeople *connect* to the home office using low-bandwidth modems or wide-area network (WAN) connections. Salespeople and managers who are based at the home office can connect via their local-area network (LAN).
4. During the connection, log files are *exchanged* which contain new information to be updated in the respective databases.
5. After the connection is completed, new data is applied to each database so that each database has up-to-date information.

6. When changes to identical data don't reconcile, *data conflicts* can occur. This happens when more than one user changes the same data at the same time on different computers. A method of conflict resolution is required to maintain consistency.

What to Look For in a Synchronization System

Since remote database synchronization technology is not included with a Database Management System (DBMS), most sales automation solutions include some synchronization features of their own, but they are not all the same. There are different methods of synchronizing data, different ways of logging and posting changes, and different levels of success. Many sales automation implementations have failed because the data synchronization technology either did not work or became so inefficient and impractical that it wasn't used by field salespeople.

1. *Efficient Data Distribution and Transport*

Successful synchronization systems minimize the amount of data distributed to remote users, minimizing expensive connection and processing times. The most effective ways to maximize efficiency of data distribution are:

- ☑ **Synchronize small subsets of the database.** A salesperson should automatically receive and use only the data that pertains to their territory, sales team, leads, or accounts they "own," not all the data.
- ☑ **Transfer only net changes to the data.** Some synchronization systems send entire database files or records and compare the data on the host system, requiring long connection times. Efficient systems log only changes to the most granular level of data – the field level – to minimize the size of data files being transferred. Data compression and encryption is recommended when sending data via modems or the Internet.
- ☑ **Post transactions off-line.** To minimize connection times, the synchronization process should not apply changes to the database while the remote computer is still connected. The connection should transfer files, hang up the modem and allow the user to conveniently apply the changes now or later. This also allows host systems to post changes during off-peak hours.
- ☑ **Allow users to "subscribe" to other data as they need it.** Remote users, such as sales managers, can have access to large amounts of data but only need to work with a small subset of the data to get the information that is timely and important to them. An efficient synchronization system has flexible selection rules to allow users to subscribe to critical data as they need it.

“Enterprises will be able to reduce communications costs and connection times by as much as 50 percent by doing the following: 1) distributing only segments of the master database to individual users; 2) transmitting field-level net change transactions only; and 3) supporting selective processing. Buyers should look for these time- and cost-saving features in products they evaluate.” (Gartner Group, 1997)

2. Standard Communications Platforms

Field salespeople using laptops, or disconnected branch offices, will occasionally establish a connection with the host system to send and receive new data. A practical synchronization system should support popular remote networking and e-mail systems to transport data. Proprietary communication methods add cost and complexity for IS administrators and require yet another method of connecting for remote users. It is also important to make the connection process as easy as possible for remote salespeople.

- Support standard remote network and e-mail connections.** Remote network protocols, such as Microsoft® RAS™, should be automatically invoked to connect to the host. If e-mail is used as a transport method, popular e-mail systems such as Internet mail, Microsoft Exchange or Lotus cc:Mail should be supported. When a user gets their e-mail, synchronization files are automatically exchanged.
- Allow LAN and WAN connections.** Occasionally salespeople have access to high-speed LAN and WAN connections. The system should have a user-selectable transport method to use the most efficient connection available.
- Simple and automatic connection for end users.** The process of connecting and exchanging transaction files should be simple and automated. The user should not have to wade through multiple screens or configure complex settings. The software should allow a scheduled connection and transfer of files with no user intervention.

3. Custom Conflict Resolution Rules

What is a synchronization *conflict*? A conflict occurs when a change (update) is “made to a local data subset and is posted to the master database *while an intervening change was made to the same record or field on the master.*” (Gartner Group, Feb 1997)

Example of a synchronization conflict:

A field salesperson is working intensely with an account and is trying to close a big sale. After an important meeting, he updates information about this opportunity in his computer, increasing the percentage likelihood of closing from the original 50% to 80%. Earlier that day, the sales manager had changed the close percentage for the same opportunity to 30%, since the sales manager was also talking to different people at the same account and had received different information. When the changes made by the field salesperson are posted to the master database, the different percentage numbers for this opportunity are in conflict. *Whose change should be retained?* This is determined by the conflict resolution rules configured by the administrator.

While most data is synchronized without conflicts, the likelihood of conflicts increases in team selling and support environments where many people are dealing with the same customer or prospect at the same time.

Most synchronization systems for sales automation software perform extremely basic conflict resolution, if conflicts are managed at all. Changes are posted based on who has synchronized last – that is, the last change posted “wins.” This scheme often does not reflect reality and can create data integrity problems, especially when remote salespeople synchronize infrequently – the typical situation. A practical conflict resolution system should:

- ☑ **Recognize conflicts at the field level.** Data conflicts should be reconciled at the field level, rather than at the record level, for maximum data accuracy and efficiency, since users may be updating different data at the same time on the same record.
- ☑ **Provide conflict resolution rules.** Most synchronization systems date-stamp transactions and post changes with a single “last in wins” rule, which may not fit the way your company does business. A synchronization system should allow the administrator to configure conflict resolution rules that test changes and post them automatically. For example, when a conflict occurs, the changes from the “account manager” or “remote user” could take precedence, based on pre-configured rules.
- ☑ **Allow for infrequent updates from remote users.** Synchronization systems should not require remote salespeople to dial in daily, or even regularly, to maintain data

consistency. Salespeople may not have access to phone lines for their modems, or may just not dial in, for several days. The system should recognize when updates from remote users contain “old” data and not post out-of-date information.

“Application vendors must provide administrative consoles that enable enterprises to implement distribution and conflict-resolution rules that reflect business rules. Administrators’ involvement in conflict resolution should be minimal.” (Gartner Group, 1997)

4. Automatic Distribution of Changes to the Application and Database

While maintaining up-to-date information about customers, leads, schedules, inventory and orders is critical, it is not the whole picture. To allow administrators to respond quickly to changing business requirements, a synchronization system must also automatically update the remote *application* to reflect changes made at the home office. Without this capability, distributing a new report to the field or adding new fields to the database, for example, would require manual reconfiguration on each remote system.

- Deliver remote application changes.** A typical sales automation application includes customizable features such as database screens, reports, field pick lists, menu and toolbar settings, automation “agents,” custom programming, and more. When the system administrator modifies these components at the home office, the components should be delivered to the field and automatically configured on the remote system during the synchronization process.
- Distribute and apply database “schema” changes.** In response to changing business requirements, administrators will modify the database “schema” – i.e. add new database tables and fields to track information. When the host database schema is modified, remote databases should automatically be updated without user intervention.

5. Flexibility and Performance

A synchronization system should be capable of supporting large-scale field implementations with potentially hundreds of users, even if your remote sales force is currently small. Some synchronization systems perform fine in small, test environments but become impractical in real world situations, especially for large groups. Besides using the most efficient means to distribute and post data, as discussed above, flexible support for modern Client/Server databases is critical to meet the demands of data synchronization.

- ☑ **Relational Client/Server database support.** High-performance synchronization requires robust database capabilities and performance only available in Client/Server databases, such as Microsoft® SQL Server®, Borland® Interbase®, Sybase®, Oracle® and others. The synchronization system should take advantage of standard SQL database technology and should support the database standards of your company. For best performance, “sole reliance on ODBC (for database access) is acceptable only in the simplest of cases; native access is a prerequisite for most applications.” (Gartner Group, 1997)
- ☑ **Database independence.** The synchronization system must be database independent to allow different database systems to reside on remote and host systems. For example, the remote system may use Borland Interbase or Sybase SQL Anywhere® databases, but the host system might be Microsoft SQL Server, Sybase, Oracle or other SQL database.

6. Robust Error Handling and Recovery

Supporting remote users is especially critical because salespeople rely on their sales automation systems for urgent information about orders, schedules, leads and more. When hardware or software problems arise, administrators need to be able to respond quickly to keep busy salespeople up and running.

- ☑ **Backup and restore of remote databases.** If a laptop is dropped, a hard drive damaged, or data files accidentally deleted, the administrator must be able to restore the remote user’s data completely. This requires that all pertinent data be synchronized with the host database, including user settings and related document files (e.g. quotes, presentations, correspondence). The salesperson’s entire environment should be restored with all data and settings from the most recent synchronization with the host.
- ☑ **Automatic error checking.** Remote communication with modems can sometimes cause problems. If a disconnection occurs in the middle of a synchronization session, the system should detect missing log files and not post incomplete log files to the destination database. Remaining log files should be transferred automatically during the subsequent connection and posted in the correct order.
- ☑ **Complete administration tools.** Administrators should be able to manage the synchronization system from a central console. The tools should support central management of user settings such as passwords, security and other synchronization profiles. For efficient resource usage, processing of log files on the server should be scheduled to run automatically during off-peak times.

Synchronization in Contact Managers

Many companies are using popular contact managers as inexpensive and informal sales automation “solutions” for their field salespeople. While shrink-wrapped contact managers provide easy tools for salespeople to maintain their contact lists, companies using these quickly encounter their limitations in synchronizing data. Synchronization features found in these products are inflexible, difficult to administer, and often do not work at all. The result is “islands of data” – critical sales information that isn’t shared with others and is often lost when a sales rep leaves the company.

“We have over 100 people using ACT! in several regional offices across the country. We need to share customer and prospect information and tried for six months to synchronize information between these offices using ACT!. We were never able to get it to work and finally gave up. It was extremely frustrating.”

*Brad Rodgers, Manager of Information Technology
Las Vegas Convention and Visitors Authority*

Contact managers use simple “flat-file” database technology that doesn’t support the robust requirements of data synchronization, especially for larger sales forces. Unlike true sales automation software, crude synchronization features found in contact managers were “added on” as an afterthought, rather than being a core part of the initial system design.

Summary and Findings

Data synchronization is a critical technology which enables salespeople to share up-to-date customer and sales information in the field. There is a wide variation in approaches and success in sales automation solutions. Evaluating synchronization systems will help avoid common pitfalls that have doomed many sales automation projects to failure.

Focus on these key areas when evaluating synchronization systems for sales automation: efficient data distribution and transport, standard communications platforms, custom conflict resolution rules, automatic delivery of application and database changes, flexibility and performance, and error handling and recovery.

Bibliography

Gartner Group, “Data Synchronization Functionality,” Sales Leadership Strategies (SLS) Technology Research Notes, February 21, 1997, K. Scherberger.

SalesLogix® Sales Information System™

Synchronization Overview

Data synchronization is a core part of the SalesLogix Sales Information System. SalesLogix combines modern Client/Server database technology, an efficient and flexible design, and centralized administration tools to deliver useful synchronization that supports changing business needs.

Highlights

- **Easy for end users** Simple “one-click” synchronization with “What’s New” view of all changes to a remote user’s data.
- **Efficient data distribution and “subscription”** Users synchronize a minimum subset of data and can subscribe to other data when needed.
- **Custom conflict resolution rules** Configure multi-level conflict resolution rules that test changes at the field level and post them automatically.
- **Support for multiple Client/Server databases** Supports Microsoft SQL Server, Borland Interbase and other Client/Server database systems.
- **Open communications transport** Use standard remote networking protocols such as Microsoft® RAS™ remote networking, Internet POP3 e-mail, WAN or LAN.
- **Automatic distribution of customization and schema changes** Customized features (e.g. database screens, reports, field pick lists, custom programming) and database schema changes are automatically distributed and configured on remote systems.
- **Automatic territory realignment** Centrally redistribute accounts, contacts, deals and activities.
- **Complete administration tools** Robust configuration and maintenance tools with server process scheduling, archiving and user administration.
- **Documents automatically synchronized** Documents in the Sales Library (marketing encyclopedia) and other attached documents are synchronized.
- **Server-based “Agents”** Run reports, SQL scripts, Basic programs and more on a pre-defined schedule for efficient maintenance and processing.

Tracking Changes

As each user makes changes to their database, SalesLogix tracks the field-level changes and stores them in *transaction exchange files*. SalesLogix tracks the time and date of the change, the user and site that performed the change, and other details. Tracking details about each transaction allows for sophisticated conflict resolution, efficient processing and data roll back.

Unlike other synchronization systems based upon “index scanning” or “stored procedure” schemes, SalesLogix’s logging allows the synchronization to be applied across different database platforms. Transaction log files generated by a SQL Server database can be applied to either an Interbase or Oracle database with no conversion required.

Communications Transport

Transaction exchange files can be transported via e-mail, Microsoft® RAS and other remote networking protocols. Users can choose the most efficient connection method available. For example, a field salesperson can choose to connect directly over the local network when they are at the home office.

SalesLogix supports the following communications methods and protocols:

Remote Network	Microsoft RAS
LAN	All network protocols (TCP/IP, NETBUI, IPX)
E-mail	Internet mail (POP3)

Since remote users typically connect with low-speed, low-bandwidth modems from the field, minimizing expensive connection times is critical. SalesLogix creates the transaction exchange files before the connect is made, compresses all files automatically and sends only net changes to the database. After files are exchanged, the communication session ends and the remote client and host server can process the transactions off-line.

In contrast to the off-line “store and forward” transport method used by SalesLogix, some sales automation products require the data exchange and transaction processing occur during an active “online” communication session. According to Gartner Group, “users should be aware that online transaction posting and conflict resolution will take longer than simply transferring files and disconnecting, and could potentially ‘steal’ processing capacity from online transaction processing if many mobile users dial in simultaneously.” (Gartner Group, February, 1997)

Resolving Conflicts

Before applying a change to the target database, SalesLogix looks at the database field it is about to change. If the field's value does not match the pending transaction's original, or "old," value, there is a conflict. Without retaining the original field value the conflict could only be resolved by a simple date/time test.

When a data conflict is identified, SalesLogix automatically applies up to three conflict resolution rules to determine whether transactions should be applied. If none of the three qualifications are sufficient to distinguish the two transactions, then the most recent change will win. This is configured by the administrator.

The following conflict resolution rules can be applied in any order:

1. A workgroup user made the current change.
2. A remote user made the current change.
3. The record's owner made the current change.
4. The current change was made most recently.

End User Interface

The process of synchronization is simple and fast. Users click File, Synchronize from the menu, or click a button in the toolbar, to display the dialog box below (Figure 2). To save time or minimize connection charges, remote users can set SalesLogix to automatically dial the host system and apply updates at a pre-determined time.

Once a connection has been established with the host, transaction files and documents are exchanged. All files are compressed and encrypted before sending for fast, secure transport. Users can choose to apply changes immediately or wait until later. The remote user can continue to use the database while the changes are being applied.

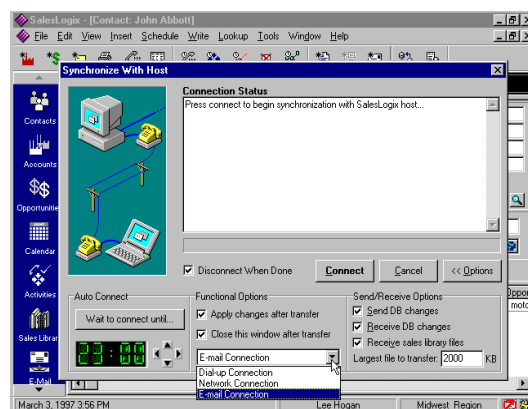


Figure 2: Simple one-click synchronization with user options.

If a user spends time both on the road and in the home office, they can change their connection method for fastest exchange. For example, a sales manager might synchronize

via the LAN when in the office and synchronize via a remote network connection when out of the office.

The most common end user complaint about synchronization is that they have no way of knowing what changes have been made to their database. SalesLogix provides the “What’s New” screen (Figure 3) to browse all changes made during synchronization, including new leads added, changes to existing accounts and contacts, changes that were rejected at the host because of conflicts, deleted records and new documents.

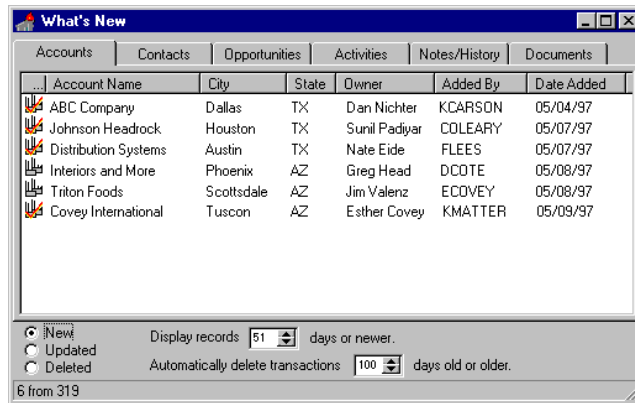


Figure 3: Remote users can quickly view changes made to their database during synchronization using “What’s New.”

Data Security and Distribution

SalesLogix’s centrally administered data security system determines what data a user has access to and what data can be synchronized. The security and synchronization systems are based on “account-level” access and distribution. That is, if a user can access a specific account record, they also have access to all contacts, notes, opportunities, histories, activities, etc., that are associated with that account. SalesLogix supports several ways to share and secure information:

1. A user can “own” accounts so that only they have access to information about these accounts. Managers automatically have access to related information about all accounts their subordinates own in the database except for “private” contacts and activities.
2. Information can also be shared between members of “Sales Teams.” All members of the sales team automatically share information assigned to their team. The “Primary Team Member” has special rights to add and delete account data and change security rights for the team.
3. Accounts can also be shared with “Everyone,” allowing all users to access information about these accounts.

When a remote user synchronizes, new information about all the accounts they *own*, or are the *primary team member*, for are automatically synchronized. This includes new leads

added to the database. The administrator controls which data is automatically synchronized to minimize processing and connection times.

Data Subscription

A remote user may have access to a large amount of customer information, but should only synchronize a relevant subset of this information to minimize processing and connection times. SalesLogix allows remote users to *subscribe* to additional information they need and synchronize this information to stay up-to-date. SalesLogix data subscription allows users to create basic selection rules to tailor what additional data is synchronized. (Figure 4)

For example, the Western Regional Sales Manager may have access to several thousand accounts which reside in her territory, but it is not necessary for her to keep data about all of them on her laptop and get updated information every time she synchronizes. She may simply want to *subscribe* to “All Accounts that have Opportunities over \$25,000” and “All National Accounts,” for example. Any accounts that met those criteria would automatically be synchronized. She could select from a pre-determined set of rules, or create her own.

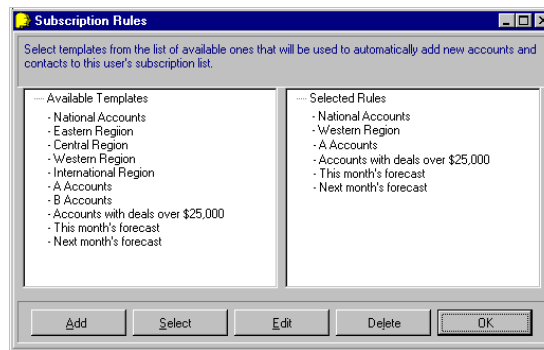


Figure 4: Remote users can subscribe to available accounts with subscription rules.

In addition to rule-based subscription, remote users can browse a list of available accounts and subscribe to selected individual accounts. When they no longer need updates, they can “unsubscribe” and minimize the subset of data that is synchronized.

Application Customization and Schema Changes

In addition to changes to customer data, SalesLogix synchronizes additional information to seamlessly distribute customized application changes from the home office to the field.

1. All database screens, reports, templates, processes, pick lists, custom programming, menu settings, saved queries and other application components are stored as files in the database and are synchronized automatically to remote users. These components, called “*plug-ins*,” can be distributed to different groups of users by the administrator. This allows for quick and seamless modification of the application without time-consuming manual updating of new information to individual users.
2. Changes to the database *schema* of the host database are automatically updated in all remote databases during synchronization. The administrator can therefore add and delete database tables and fields in the host system and automatically roll out the changes to the field. This allows rapid response and distribution as changes to the database are made.
3. *User settings* such as window defaults, calendar preferences and other options are also stored in the database, not in the Windows registry or INI files outside the database. Users can therefore login to SalesLogix on different computers and retain their own personal default settings. Also, if the user has hardware or software problems in the field and their database needs to be rebuilt, the user’s settings can be restored completely.

Administration and Maintenance

SalesLogix provides several tools to configure and maintain data synchronization. The *Workgroup Administrator* is the tool used to control user configuration, process scheduling, data security, conflict resolution and default settings for synchronization and subscription.

Once an arduous manual task, SalesLogix’s *territory realignment* allows administrators to transfer accounts from one user or sales team to another based upon geography or other business rule. Changes performed by the realignment are sent to remote users via the synchronization system. Thus, data can be removed from one user’s laptop when territories change and downloaded to the new salesperson’s computer automatically. All account, contact, opportunity and calendar information is reassigned to the new user.

SalesLogix supports a “roll back” capability to re-process lost data if connection or hardware problems occur. This is possible due to the use of a *permanent log file* on the server. The permanent log file is a chronological accumulation of all changes produced by both remote and connected users. Should a problem with your e-mail or communications system occur, SalesLogix will automatically request a new copy of the missing data.

System Requirements and Compatibility

The SalesLogix Sales Information System family of products includes two products required for data synchronization – the Remote Client and Synchronization Server. The *Remote Client* is used on laptop or desktop computers that are occasionally connected to the host server. The Remote Client includes a local SQL database and support for data synchronization and subscription.

The *Synchronization Server* is software that distributes data and manages data exchange between remote clients and the host system. The Synchronization Server runs on a workstation connected to the database server. The *Workgroup Server* is the host system software that supports Workgroup and Remote Clients. The Workgroup Server includes complete administration and customization tools and an optional SQL Workgroup Database Server software used if the host database is not Microsoft SQL Server.

Hardware and Software Requirements

SalesLogix Workgroup Server

- Pentium computer (100 Mhz or faster)
- Windows 95 or Windows NT 4.0
- 32 MB RAM (at least 64 MB RAM recommended)
- At least 50 MB hard disk space

SalesLogix Synchronization Server

- Pentium computer (100 Mhz or faster)
- Windows 95 or Windows NT 4.0
- 32 MB RAM (at least 64 MB RAM recommended)
- At least 100 MB hard disk space

SalesLogix Remote Client

- Pentium computer (100 Mhz or faster)
- Windows 95 or Windows NT 4.0
- 32 MB RAM
- At least 40 MB hard disk space
- Modem required for remote connection

Database Compatibility

SalesLogix is a SQL Client/Server system that currently supports Microsoft SQL Server and Borland Interbase databases. Borland Interbase is a SQL92-compatible embedded Client/Server database used on the remote computers. Microsoft SQL Server and other databases (Oracle support coming summer, 1997) are accessed via fast direct connections, not slower ODBC.

About SalesLogix Corporation

SalesLogix Corporation develops and markets the SalesLogix® Sales Information System™, a breakthrough sales automation solution for companies that have outgrown the functionality delivered by contact managers, but don't want the implementation burdens and high prices that associated with traditional high-end sales automation software.

SalesLogix Founder, President and CEO Pat Sullivan is a sales automation visionary and pioneer. Sullivan was former co-founder, president and CEO of Contact Software International, the original developer/marketer of ACT!®, the best-selling contact manager and acknowledged creator of the contact management software category.

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