



VisualAge[®] Generator

A Powerful New Vision of Programming.™

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Happy New Year



Formerly the VisualGen Newsletter

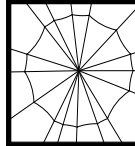
Why Have So Many Customers Chosen VisualAge Generator?

by Sandra J. Johnson, VisualAge Generator Product Manager

Why have so many customers chosen VisualAge Generator for building mission-critical, multi-tier, client/server solutions? Great question! This year, over 600 customers chose VisualAge Generator to develop and deploy their applications in a variety of execution environments! It's been a great year, *thanks to you, our customers*. But what was the deciding factor? Was it because VisualAge Generator...

- ✓ Is a powerful, object-oriented solution?
- ✓ Has a complete, integrated development and test environment?
- ✓ Provides visual programming for creating GUI client applications?
- ✓ Increases programmer productivity?
- ✓ Is the best-of-breed interactive test facility (ITF)?
- ✓ Has built-in middleware?
- ✓ Provides access to many databases?
- ✓ Is available on a wide variety of execution platforms?
- ✓ Includes dynamic application partitioning?
- ✓ Lets you access TUI applications on the Internet or your own Intranet?

If you would like to hear for yourself what some VisualAge Generator customers are saying about the product, check out the **Headlines** section of our web page. You can find it at: <http://www.software.ibm.com/ad/visgen>. You can also find additional customer testimonials, back issues of newsletters, technical papers, and articles, AND try the product for yourself by getting a copy of the Version 2.2 Evaluation CD-ROM (GK2T-2267). To get a copy of the CD, contact your IBM representative.

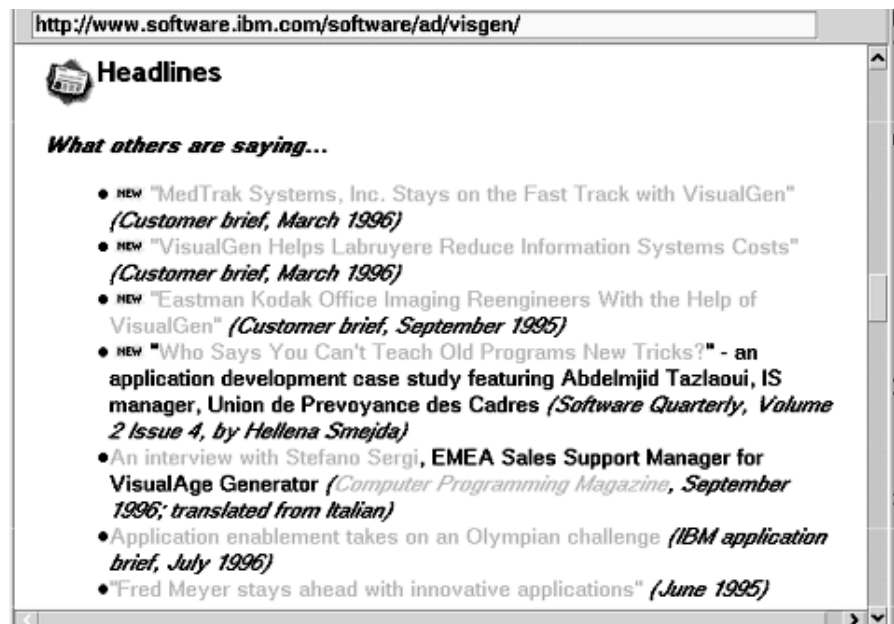


Web News

<http://www.software.ibm.com/ad/visgen>

VisualAge Generator's Web page contains the most up-to-date and latest news about the product. Look for these featured categories:

- Product description
- What's new
- Headlines
- About this product
- Places to be
- Ordering
- Education
- Services
- Bookshelf
- Support



Minimize Communication, Maximize Performance!

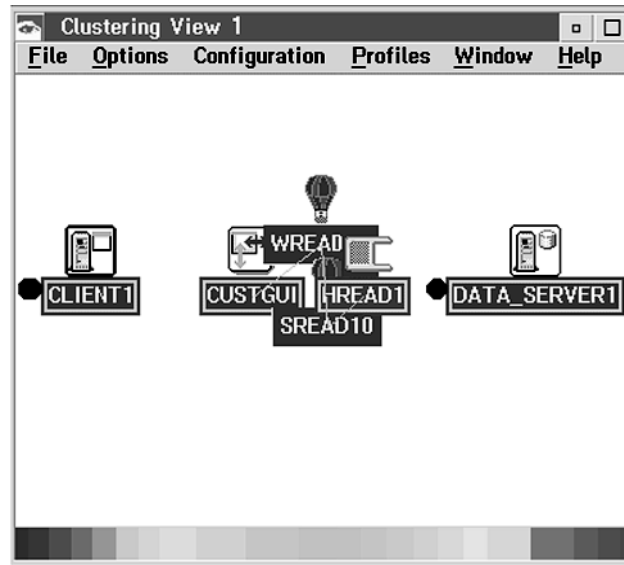
With VisualAge Generator's Dynamic Application Partitioning

by Sandy Thomas, Marva Richey, and Rebecca Schaller, VisualAge Generator Development

In most situations, the more communication there is between two or more parties, the better the relationship. This does not hold true when it comes to applications and machines in a client/server environment. In an ideal distributed application system, extensive communication between applications on different machines slows performance and should be kept to a minimum. In this case, the *less* the communication, the *better* the performance.

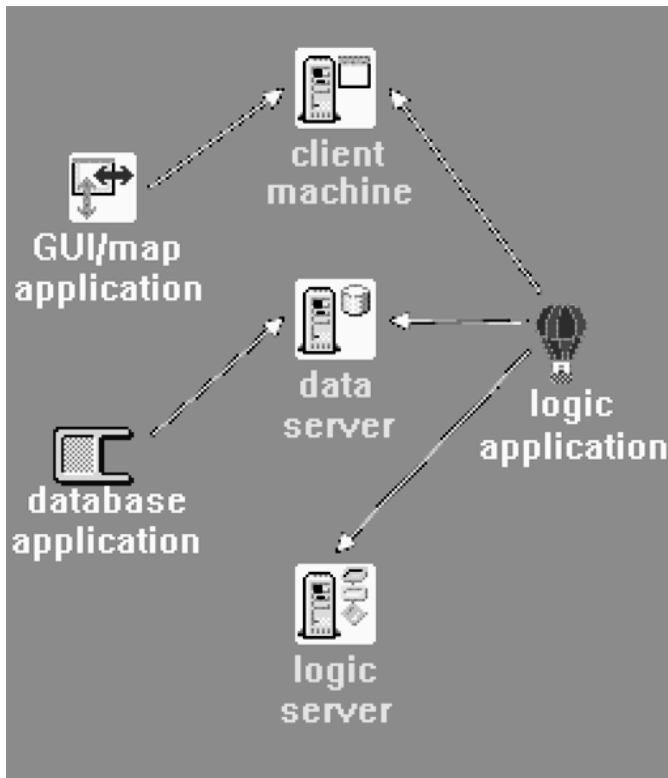
Dynamic application partitioning is a powerful new feature of the VisualAge Generator Interactive Test Facility (ITF). This feature examines the interactions between applications and determines how you can appropriately partition an application system to get optimal performance.

Dynamic application partitioning creates icons for target machines and applications so you can see, in real-time, the interaction between the applications (for example, calls and transfer of data). Applications that communicate extensively with each other or transfer a lot of data will cluster together. You can then use this knowledge to make better choices regarding which applications to place on which machines.



The Clustering View 1 window above illustrates the application interactions performed by dynamic application partitioning. The first time a call is made from one application to another, an application icon appears in the window. As each new application is called, an application icon appears and begins to move toward the application that communicates with it. You can create target machine icons before the test begins or the system creates them as needed.

In the following figure, dynamic application partitioning automatically places GUI and map applications on a client machine. Database applications are placed on a database server machine. Logic applications (contain no I/O) cluster according to the number of interactions. Either during or after testing, you can manually place logic applications on an appropriate machine.



In the Clustering View 1 window below, the CUSTGUI GUI application is placed on the CLIENT1 client machine. The HREAD1 database application is placed on the DATA_SERVER1 server machine. WREAD10, SREAD1, and SREAD10 are all logic applications and allowed to float during testing to be placed on a target machine after testing completes.

The color of the label under the application icons indicates the number of calls the application receives or sends during the test run. The color can range from blue, indicating few calls, to red, indicating many calls. The full spectrum of colors is displayed at the bottom of the window.

Notice also the line drawn between each interacting pair of applications. Think of the line as a spring trying to pull two applications together. The more two applications interact, the harder the spring tries to pull them together. As with the labels, the color of the line indicates how much pull there is between the two applications. The color can range from blue (little pull) to red (strong pull). Blue lines indicate applications that are suitably

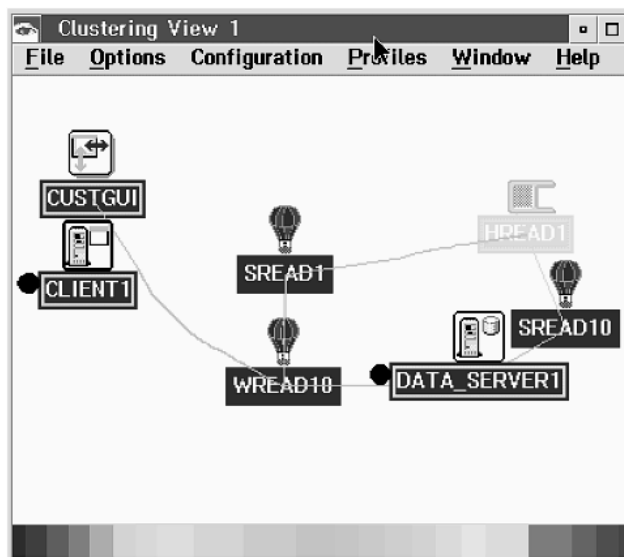
positioned relative to other applications, considering the amount they have interacted. Red lines indicate applications that are too far apart.

In this example, there is a medium to strong pull between the SREAD10 logic application and the HREAD1 database application. Because of the amount of communication between these applications, you could improve performance by placing these applications on the same machine. Applications WREAD10 and SREAD1 have a small amount of pull toward the applications on the CLIENT1 and DATA_SERVER1 target machines. As a result, you can place them on the either client or database server machines or on a separate logic server machine.

The partitioning feature lets you create multiple views to observe the performance of applications with different configurations. The position at which the applications finally settle relative to one another provide guidance concerning the machine on which you should place the application in a client/server or n-tier architecture. When you have placed the applications for best performance, you can perform code generation without leaving the test environment.

For More Information!

The dynamic application partitioning feature is a part of the VisualAge Generator Version 2.2 refresh product. For more information, contact your local IBM representative.



To CICS or Not to CICS...

By Stefano Sergi and Paul Hoffman, VisualAge Generator Development

This article provides an example of how business application requirements can guide your middleware choice to a true On-line Transaction Processing (OLTP) Monitor.

The variety of client/server communication options supported by VisualAge Generator through its simplified remote procedure call protocol should not lead the information system architect to the assumption that the 4GL interface makes the choice of this key layer irrelevant.

In particular, it is of great importance to realize that VisualAge Generator's own middleware layer is no substitute for true OLTP software, and that where application requirements call for robust transaction management, a CICS network is the recommended solution.

Transactions

A transaction is the fundamental unit of recovery, consistency, and concurrency in a client/server system. It is composed of a set of actions characterized by the "ACID" properties described below:

Atomicity

All actions make up an indivisible unit of work. This implies that all actions (database updates, file updates, the queuing of messages, and the displaying of data to the end-user) must succeed, or they all fail.

Consistency

At the end of a transaction the system must be in a correct state. This implies that if a stable end state

cannot be achieved, the system must return to the initial (prior to transaction start) state.

Isolation

The behavior of a transaction is not affected by execution of concurrent transactions. This implies that a transaction must serialize all access to shared resources so that concurrent programs will not corrupt each other's operations.

Durability

The effects of a transaction are permanent after it commits.

Let's clarify with a simple debit-credit banking operation example. Bill writes a \$500 check to Joe who deposits the check in his checking account. A number of actions will have to occur as an indivisible unit as follows:

- Bill's account is debited \$500
- The debit transaction must be recorded into the Movements log
- Joe's account is credited \$500
- The credit transaction must be recorded into the Movements log

It is easy to see how commitment of all 4 updates must be coordinated, especially if these accounts reside on different systems.

In addition, it is important to ensure that while Bill's account is being debited the \$500, any other transaction against the account must be prevented until the entire current

transaction (and not just the \$500 debit on Bill's account) is complete and the system is left in a stable state. That is, once all accounts balances are correct and ready for new transactions.

It is clear that if the system fails after completion of the transaction commit, once the system is restarted, the balances must reflect the completed transaction.

Transaction Management

In a world without transaction processing monitors, much of the code required to guarantee the ACID properties that were just described would have to be written in each business application that changes the state of resources. This would be a compelling enough reason to consider OLTP software, such as CICS, as client/server middleware. OLTP software are designed to guarantee that all programs executing under their supervision follow the ACID properties rules.

But as the number of concurrent users increases, an additional benefit becomes apparent.

Without a transaction processing monitor, each new server transaction requires a new process to start and a number of resources (for example, memory, communication connections, and file handles) to be allocated to that process. In systems with high number of concurrent users or high transaction rates, this could quickly lead to exhausting the system resources with consequent operating system failure.

OLTP monitors are designed specifically to provide process

management, which is the ability to start server processes that can handle multiple transactions sequentially, funneling work to the OLTP monitors, monitoring the OLTP monitors execution, and balancing OLTP monitor's workload.

Pamukbank Application Requirements

One of VisualAge Generator's most sophisticated customers is Pamukbank. Pamukbank is one of Turkey's largest banks with headquarters in Istanbul and over one hundred branches nationwide.

Pamukbank is tackling the ambitious task to re-engineer their branch automation system in a 3-tier client/server topology as shown in the figure below.

The system will provide all bank tellers with a GUI front-end, running on Windows 3.1 workstations. Account data is available at the branch local server, a RS/6000 machine, to guarantee a certain level of operation during host link down time. The account information is also kept in a central MVS host. Movements records are kept centrally in the host system for periodic processing, such as accounting procedures and summary of account activities.

With this configuration, the typical deposit and withdrawal transactions follows some basic business rules, such as the following:

- A withdrawal transaction is always rejected if the host link is down.

If the link is up, the transaction proceeds and both the local and remote account databases must be updated synchronously; that is, their updates must be part of the same Logical Unit of Work (LUW). The movements database can be updated asynchronously, although the update must be assured if the account databases were successfully updated.

- A deposit transaction, instead, is always accepted regardless of the state of the host link.

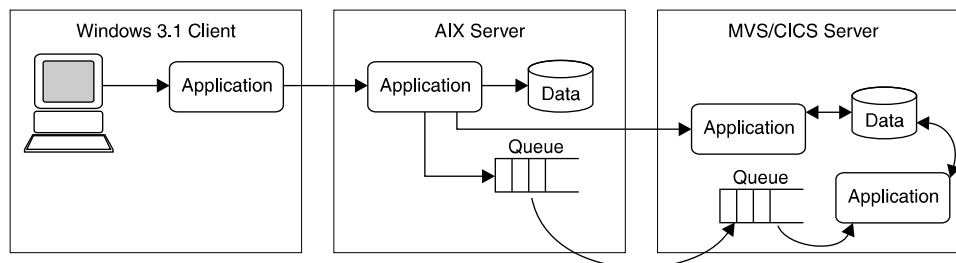
If the link is down, the local account database is updated immediately, while the host account database can be updated asynchronously. With asynchronous updates, it is necessary to assure the delivery of the update once the link is active again.

- All updates must be propagated asynchronously to other branches' local databases.

The above business requirements, implemented in the legacy system as a host-based CICS application, can now be implemented on a network through the functionality from new, network-based products. For example, the assured delivery of asynchronous database updates can be supported by message and queuing products such as IBM MQSeries. Synchronous update of local and remote databases can be realized through two-phase commit support provided by database management systems or OLTP monitor products.

Pamukbank had to analyze and understand the advantages and disadvantages of each possible implementation choice. In their case, the host environment was the pre-existing CICS/ESA, and given a Windows requirement for the client machines, the alternatives evaluated for transaction management were as follows:

- LAN server running AIX and DB2/6000. DB2/6000 provides two-phase commit, and IBM MQSeries provides assured delivery. VisualAge Generator middleware connects Windows 3.1 client and AIX.



- LAN server running AIX, CICS/6000, and DB2/6000. CICS provides two-phase commit, and IBM MQSeries provides assured delivery. CICS client middleware connects Windows 3.1 and AIX.
- MVS DB2 updates cause less line traffic in the CICS scenario. With CICS, all the database update information can flow to the host on a single server application, rather than having multiple tables updated using several distributed database calls.

Advantages

CICS was chosen as the solution because it had the following advantages:

- CICS/6000 coordinates a two-phase commit across platforms and resource managers. In the Pamukbank scenario, CICS/6000 coordinates the commit of MVS and AIX DB2 updates and MQSeries messages, which is not done in the first solution. CICS recoverable files and queues would also be included in the commit scope, if they were used in the transaction.
- CICS/6000 enables the commit to be controlled by the Windows client application using the CICS client interface, greatly reducing the possibility of a transaction completing successfully without the client application knowing about it. If VisualAge Generator middleware is used, the server commits before returning to the client. The teller would not receive notification of the completion of the transaction if the link to the server went down while the transaction was being processed.
- CICS/6000 regions handle multiple transactions more efficiently. A process start and database connection are not required for each transaction as is the case for the first scenario.

Conclusion

Even though requirements might be significantly different, many considerations presented in this article apply whenever you are trying to build a distributed transactional application system. Keep these considerations in mind during the project planning stage of such systems.

Bibliography

- Orfali, Hakkey, Edwards — *Essential Client/Server Survival Guide*
- IBM ITSO Redbook (GG24-4361) — *Designing a Distributed CICS Application*

File Support in the C++ Environments

by Chuck Proffer and Susan Lafera, VisualAge Generator Development

A VisualAge Generator V2.2 application can access data residing in SQL tables or data in a variety of file formats. This article discusses the characteristics and options of the file types that a VisualAge Generator application can access in the native C++ environments (AIX, OS/2, and Windows NT).

The following lists the file types that are currently supported in each environment:

File Type	Environment Supported
Sequential (SEQ)	AIX OS/2 Windows NT
Btrieve (BTRIEVE)	OS/2 Windows NT
Micro Focus (MFCOBOL)	OS/2
VSAM/2 (IBMCOBOL)	OS/2

To indicate the file format for an application in the resource association file, specify the FILETYPE parameter on the ASSOCIATE statement. To change the file type accessed by an application, change the value of the FILETYPE parameter on the ASSOCIATE statement. You do not have to change the application or generate the application again.

The special function word, EZERT8, contains the return code from each I/O operation. However, the return codes are dependent on the runtime environment and file type. To make your application

more portable between file types and the runtime environments, specify the I/O error values, such as DUP, EOF, FNF, NRF, and ERR.

Sequential (SEQ) Files Characteristics

Sequential files are collections of records stored and processed sequentially, one after the other. The only process options allowed are ADD, SCAN, and CLOSE. To update records a sequential file, the entire file must be read and rewritten. Sequential files can be text or binary.

Sequential files that contain control characters at the end of each record are called *text files*. You can create text files with a VisualAge Generator application or a text editor. On OS/2 and Windows NT, the end of each record contains a carriage return (0x0D) and line feed (0x0A). On AIX, each record is delimited by a line feed only.

Binary files typically do not contain carriage return or line feeds at the end of each record. The file is a contiguous string of bytes.

The support for sequential files is provided by each operating system. There are no prerequisite products required.

Resource Association File Options

The following are resource association options for the file support:

/FILETYPE=SEQ

Specifies access to sequential file.

/TEXT

Specifies a special type of sequential file that contains carriage return (CR) and line feed (LF) characters at the end of each record. When a record is read (SCAN), the CRLF characters are automatically removed. When a record is written (ADD), the CRLF characters are automatically added to the end of each record.

/REPLACE

Specifies that if the file exists, its contents should be replaced. Otherwise, any new records added are appended to the end of the file.

/SYSNAME

Specifies the system name of the file.

Return Code Information

The return codes are documented in the C compiler INCLUDE file, ERRNO.H, which is in the compiler's INCLUDE directory.

Btrieve Files (BTRIEVE) Characteristics

Btrieve files support serial and indexed record organizations. Records must be fixed length. Typically, indexed files consist of one file for the data and another file for the index. The *data file* contains the actual data records whereas the

index file contains the keys with a pointer to the record in the data file. However, Btrieve files contain the data and index(es) in the same file. Btrieve builds an index for each key defined. Indexed files can have a primary key and one or more secondary keys.

To access Btrieve files from a VisualAge Generator application, you must install the Btrieve Client product. For more information on Btrieve files, contact Pervasive Software at 1-800-BTRIEVE.

Resource Association File Options

/FILETYPE=BTRIEVE

Specifies access to a Btrieve file.

/KEYS

Specifies the key definition for a BTRIEVE file. If the application creates the Btrieve file and the file has secondary keys, the /KEYS option enables you to specify the key definition. This option must be specified when the file is initially created.

/SYSNAME

Specifies the system name of the file.

Return Code Information

The return codes are documented in the *Btrieve Installation and Operation* document under Status Codes and Messages.

Micro Focus Files (MFCOBOL) Characteristics

Micro Focus (MFCOBOL) files support serial, indexed, or relative record organizations. Records can be either fixed or variable length. Indexed file consist of one file for the data and another file for the index. The data file contains the actual data records whereas the index file contains the keys with a pointer to the record in the data component. When the data file is created, Micro Focus automatically creates the index file (.IDX), including alternate indexes. A REBUILD utility is provided by Micro Focus that can recover corrupt indexes or add additional secondary keys after the index file has been created.

To access Micro Focus files, you must build the Micro Focus runtime (EXTFH.DLL), which is part of the compiler. The *Running VisualAge Generator Applications on OS/2, AIX, and Windows* document describes the steps necessary to build the EXTFH.DLL file. For more information on Micro Focus files, contact Micro Focus Ltd..

Resource Association File Options

/FILETYPE=MFCOBOL

Specifies access to a Micro Focus (MFCOBOL) file.

/KEYS

Specifies the key definition for a Micro Focus file. If the application creates the Micro Focus file and the file has secondary keys, the /KEYS option allows you to specify the key definition. This option must be specified when the file is initially created.

/SYSNAME

Specifies the system name of the file. Always specify the name of the data component. Micro Focus determines the name of the index component based on the data component name.

Return Code Information

The return codes are documented in the *Micro Focus COBOL Error Messages* document under File Status Codes.

VSAM/2 (IBMCOBOL) Characteristics

VSAM/2 (IBMCOBOL) files support serial, indexed, or relative record organizations. Indexed files consist of one file for the data and another file for the index. The index and alternate index files are created automatically when the data file is created. The primary index file name is the same as the data file name prefaced with an @ sign. Secondary keys or alternate indexes are also separate files. Because VSAM/2 stores the names of the alternate indexes in the extended attributes of the data file, you cannot use the OS/2 RENAME command to rename VSAM/2 files.

The VSAM/2 runtime product is shipped with VisualAge Generator Workgroup Services V2.2.

VSAM/2 is a component of the IBM SMARTdata Utilities product. VSAM/2 also provides the capability to access host VSAM files transparently from a VisualAge Generator application running on OS/2. Look for a future article on the topic of accessing host VSAM files. For more information on VSAM/2 files, refer to the *VSAM in a Distributed Environment* (SC26-7063) document.

Resource Association File Parameters

/FILETYPE=IBMCOBOL

Specifies access to a VSAM/2 (IBMCOBOL) file.

/BASENAME

Specifies the name of the primary key file when using IBMCOBOL files that have secondary keys. If the IBMCOBOL file has secondary keys, a separate entry with a unique filename (/SYSNAME) is needed in the resource association file for each key definition with the /BASENAME option referencing the primary key file. An alternate index file is created for each secondary key and it will be associated with the primary key file.

For example, if the file had a primary key and two secondary keys, you would specify the following in the resource association file:

```
associate file=payrmast /filetype=ibmcobol  
  /sysname=payroll.dat  
  
associate file=payralt1 /filetype=ibmcobol  
  /sysname=payralt1.dat /basename=payroll.dat  
  
associate file=payralt2 /filetype=ibmcobol  
  /sysname=payralt2.dat /basename=payroll.dat
```

If duplicates are to be allowed on any of the keys, you need to specify the /DUP option for that particular entry.

/DUP

Specifies that duplicate record keys are allowed for IBMCOBOL indexed files. This option must be specified when the file is created. The default is to not allow duplicate keys.

/SYSNAME

Specifies the system name of the file. For the primary key, specify the name of the data component. VSAM/2 determines the name of the primary index component based on the data component name. For secondary keys, /SYSNAME specifies the name of the alternate index file.

Return Code Information

The return codes are documented in the *VSAM in a Distributed Environment* (SC26-7063) document under VSAM Reply Messages.

Acronyms

4GL	fourth-generation language
AIX	Advanced Interactive Executive
AS/400	Application Systems/400
CAE/2	Client Application Enabler/2
CASE	Computer-aided Software Engineering
CICS	Customer Information Control System
CICS/6000	Customer Information Control System
CPU	Central Processing Unit
CSP	Cross System Product
DB2	Database 2
DDL	data definition language
DBMS	database management systems
DRDA	distributed relational database architecture
EMEA	Europe/Middle East/Africa
GUI	graphical user interface
HONE	Hands-On Network Environment
IBM	International Business Machines
IMS	Information Management System
ITSO	International Technical Support Organization
LAN	Local Area Network
LUW	Logical Unit of Work
MSL	member specifications library
MVS	Multiple Virtual Storage
NT	Notes
OS/2	Operating System/2
OS/400	Operating System/400
RAD	rapid application development
SDK/2	software developers kit-OS/2
TCP/IP	Transmission Control Protocol/Internet Protocol
VM	Virtual Machine
VSE	Virtual Storage Extended
WWW	World Wide Web

VisualAge Generator Icon Builder

by Nick Portanova, VisualAge Generator Service Support

VisualAge Generator V2.2 has two new command files that automatically build the product folders and icons for you. The command files are EZEFLDR.CMD (for VisualAge Generator Developer) and ELAFLDR.CMD (for VisualAge Generator Workgroup Services). These command files build the folder and icons for their respective products. The EZEFLDR.CMD and ELAFLDR.CMD files are located in the SAMPLES subdirectory.

The command files can also be used for other purposes as follows:

- If the desktop becomes corrupted and the folders are lost, the command file will put the folder and icons back the way they were when the product was installed. If you customized the folder and icons after installation, you need to do the same customization after running the command file.
- If you install the product on the LAN and provide access for every developer, the command file can be run on each developer's workstation to make a folder and icons for the developers. It appears to the user that the product is actually installed on their individual machines. (It is assumed here that the user's CONFIG.SYS has already been updated to have the path type statements already pointing to the LAN drive and directory structure.)

When running the product from the LAN, be sure to enter the location of the code when prompted by the command file which builds the folder and icons. For example, you would be prompted to enter either X:\EZERDEV2 or X:\VGWGS2. Enter the LAN drive that you did a net use to and the directory where the code is located.

Finally, if you have a folder for VisualAge Generator Developer V2.2 or VisualAge Generator Workgroup Services V2.2 and you run the command files, the folder is deleted and rebuilt. Anything you had in the folder previously is deleted and rebuilt as it was when the product was installed. The deletion of the folder and icons is done so that the command file can be run multiple times, if needed.



A VisualAge Generator Fact

The largest single industry segment using VisualAge Generator today is government, ranging from a small city government to a national pension system in Europe.

Client/Server Redbook for AS/400

To learn more about how to get the most performance out of your VisualAge Generator client/server applications, get the *AS/400 Client/Server Performance Using Application Development Tools* (SG24-4731) document. This redbook contains detailed information on how to develop high performance AS/400 client/server applications. It takes you through an application development scenario using some of the most popular application development tools, including VisualAge Generator and VisualAge Smalltalk. The focus is on achieving maximum performance with the application development tools.

This redbook can be used at two levels. You can use this redbook to gain an understanding of how to use the tools to access the AS/400 systems. This can be helpful in selecting the proper tool. The document also provides in-depth, tool-specific tips and techniques for developing AS/400 client/server applications.

For more information on this redbook and other redbooks, visit the Redbooks Homepage at:

<http://www.redbooks.ibm.com/redbooks>

Once you are at the redbook homepage, do a search on the document number to locate the document faster.

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The VisualAge Generator Web Page

Visit our Web site at:

<http://www.software.ibm.com/software/ad/visgen>

Using Telnet to Access VisualAge Generator Applications on OS/2

by Chuck Proffer and Susan Lafera, VisualAge Generator Development

Telnet is a terminal emulation program shipped with TCP/IP on OS/2 and AIX that enables you to login to remote computers. It provides the capability to run VisualAge Generator Text User Interface (TUI) applications on OS/2 and AIX. This is especially useful for accessing remote systems when a local terminal is not available.

The first step in accessing either an OS/2 or AIX system, is choosing the type of terminal to emulate. Each type of terminal supports different capabilities. For example, some terminals support only 10 function keys and support only monochromatic displays. Many VisualAge Generator applications require 24 function keys and a color display. Telnet is capable of emulating several different terminals; however, only ANSI and HFT provide the necessary capabilities. This article describes how to configure an OS/2 client and telnet to another OS/2 or AIX system.

Note: These procedures were tested on a system running OS/2 WARP Connect with TCP/IP V3.0. Earlier versions of TCP/IP will work; however, the customization steps might be different.

Accessing AIX Systems

To access the AIX system, you need to first configure the telnet session.

Configure the Telnet Session

To access an AIX system from an OS/2 client, complete the following steps on the OS/2 client machine:

1. Set the ETC environment variable in your CONFIG.SYS file. It should point to the x:\MPTN\ETC directory. If you make changes to your CONFIG.SYS file, reboot your machine.
2. Open the settings notebook for Telnet (in the TCP/IP folder).
3. Set the host name to the system you want to login to.
4. Set the terminal type to HFT
The HFT terminal type supports 24 function keys and color, so you do not need to customize anything.
5. Save the settings.

To establish the session, select the **Telnet** icon in the **TCP/IP** folder and specify the userid and password for the system you are connecting to. You can also start telnet from an OS/2 command prompt, but you have to specify the type of terminal (-t), and the hostname (that is, >telnet -t hft idaho).

Accessing OS/2 Systems

To access the OS/2 system, you need to first configure the telnet session.

Configure the Telnet Session

To access an OS/2 system from an OS/2 client, complete the following steps on the OS/2 client machine:

1. Set the ETC environment variable in your CONFIG.SYS file. It should point to the x:\MPTN\ETC directory. If you make changes to your CONFIG.SYS file, reboot your machine.
2. Open the settings notebook for Telnet (in the TCP/IP folder).
3. Set the host name to the system you want to login to.
4. Set the terminal type to ANSI.
5. Set the configuration file to telnet (that is, use the telnet.cfg file in the ETC directory).
6. Save the settings.

Customize the keyboard

To customize the keyboard, complete the following steps on the OS/2 client machine:

1. Open the **TCP/IP utilities** folder and select **Telnet Customization**. The **Setterm** window is displayed.
2. Select ANSI as the emulator type.
3. Select Keyboard mapping.
4. Remap function keys 11 through 20 (the ANSI definition already contains function keys 1 through 10).

Note: The Setterm utility only supports function keys 1 through 20 so you cannot remap function keys 21 through 24. Functions keys 21 and 22 work without remapping them.

To remap a key, select the key you want to remap, then in the **Base** field, specify the key that you want to map it to. For example, to remap F11, select the F11 key. F11 is displayed as the "Current Key" at the bottom of the screen. Select the drop down list for the **Base** field, then scroll down until you see PF11. Select PF11, then select the **Save Key** button. Repeat these steps until you have mapped all of the keys.

5. Select **Save** and **Exit** to save the definition in telnet.cfg.

Specify a Telnet Password and Autostart Telnetd

To specify a telnet password and autostart telnetd, complete the following steps on the OS/2 server machine. *Telnetd* is the telnet daemon that must be running on the server machine to process requests from telnet clients.

1. Open the TCP/IP Configuration notebook (in the TCP/IP folder).
2. Select the **Security** tab.
3. Specify a password in the **Telnet password** field. When an OS/2 client tries to telnet to this machine, the client is prompted for this password.
4. Select the **Autostart** tab.
5. Select **telnetd**, then select **Autostart service**.
6. Specify either **detached** or **foreground session-minimized**.
7. Save the configuration.
8. Reboot (which will now autostart telnetd) or manually start telnetd this time. To manually start telnetd, issue a START TELNETD command from an OS/2 command prompt.

To establish the session, select the **Telnet** icon in the **TCP/IP** folder and specify the password. You can also start telnet from an OS/2 command prompt, but you have to specify the type of terminal (-t), the configuration file (-f), and the host name (that is, >telnet -t hft -f telnet.cfg idaho).



A VisualAge Generator Fact

The smallest and newest country in the world, Sri Lanka, uses VisualAge Generator for its banking needs.

Product Support Expiration Dates

by Ruth Walthall, VisualAge Generator Service Support

The following are the product support expiration dates for the VisualGen and VisualAge Generator products:

VisualGen Products	Version/ Release	End of Support Date
VisualGen Developer for OS/2	V1.0	06/30/95
VisualGen Developer for OS/2	V1.1	04/30/96
VisualGen Developer for OS/2	V2.0	06/30/97
VisualGen Application Generator	V1.0	04/30/96
VisualGen AIX Application Generator	V1.1	04/30/96
VisualGen MVS Application Generator	V1.0	04/30/96
VisualGen OS/2 Application Generator	V1.1	04/30/96
VisualGen OS/400 Application Generator	V1.0	04/30/96
VisualGen VSE Application Generator	V1.0	04/30/96
VisualGen AIX Application Generator	V2.0	06/30/97
VisualGen MVS Application Generator	V2.0	06/30/97
VisualGen OS/2 Application Generator	V2.0	06/30/97
VisualGen OS/400 Application Generator	V2.0	06/30/97
VisualGen VSE Application Generator	V2.0	06/30/97
VisualGen Workgroup Services	V1.0	06/30/96
VisualGen Workgroup Services for OS/2	V1.1	06/30/96
VisualGen Workgroup Services for AIX	V1.1	06/30/96
VisualGen Workgroup Services for OS/2	V2.0	06/30/97
VisualGen Workgroup Services for AIX	V2.0	06/30/97
VisualGen Host Services for MVS, VSE, and VM	V1.1	None at this time
VisualGen Host Services for OS/400	V3.1	None at this time
VisualGen Host Services for OS/400	V3.6	10/31/98

The following VisualAge Generator products service expiration dates might change, depending on the availability dates of any follow-on products. Notification of product expiration dates are posted on IBM Talklink and CompuServe forums.

VisualAge Generator Products	Version/ Release	End of Support Date
VisualAge Generator Developer for OS/2	V2.2	12/31/97
VisualAge Generator Workgroup Services (OS/2)	V2.2	12/31/97

Get Registered!

by Dave Hardy, VisualAge Generator Service Support

VisualAge Generator Developer Version 2.2 provides an online software registration utility that registers the VisualAge Generator Developer product when it is started. The software registration utility is automatically invoked each time you start VisualAge Generator Developer. The first time you start VisualAge Generator Developer, a GUI window is displayed to facilitate the online registration. The registration process can occur by fax, mail, phone, or online. You are presented with the GUI window every ten days

until the number you received from the registration process is placed in the registration utility memory. At intervals of one year and two years from the initial registration, you are presented again with the GUI window to enter feedback about the product. At this time, you can also make changes to the product registration information.

To get to the software registration utility, click on the **Software Registration** icon in the **VisualAge Generator Developer**

folder. You can start the registration utility at any time to update the registration record or enter the registration number that you receive from the registration process.

You can disable the online product registration utility by executing the ARTADMIN.EXE file that is located in the directory where you installed VisualAge Generator Developer for OS/2. The default directory is EZERDEV2.

Ready, Set, Migrate!

by Jeri Petersen and Nina Newton, VisualAge Generator Development

The following is a list of tasks you need to perform to ensure that your migration from VisualGen 2.0 to VisualAge Generator 2.2 goes more smoothly. Refer to the *Installing VisualAge Generator Developer* (GH23-0243) and *Installing VisualAge Generator Workgroup Services* (GH23-0240) documents for additional information.

- Save a copy of the EZERDEV.INI file (or whichever file EZERDEV.INI is pointing to)
- Save a copy of the file that DNAINI is pointing to
- Save copies of any templates or options files you modified that are still in the product EZERDEV2 directories
- Save a copy of the EFKGEN.INI file (or whichever file GENERATE.INI is pointing to)
- Delete the previous version of VisualGen, reboot, install VisualAge Generator, and reboot.

For C++ Workgroup Services:

- Use environment variables FCWDBUSER and FCWDBPASSWORD on the OS/2 and Windows NT systems to specify the userid and password that you will use for the database connection. These environment variables were previously used only on AIX. This applies to users of DB2/2 V2.1 or later and DB2 for Windows NT V2.1 or later.
- Use environment variable FCWDBNOOP when running with CICS/6000 to indicate whether you want C++ Workgroup Services to issue commits and rollbacks. If your databases are XA-defined under CICS/6000, set (export) FCWDBNOOP to YES (to indicate that CICS/6000 will handle the commits and rollbacks).

For binding SQL files:

- Use Database 2 OS/2 (DB2/2) Version 1.2 with the EZE2DB1.BND and EZE2DB1.DLL files.
- Use Database 2 OS/2 (DB2/2) Version 2.1 with the EZE2DB2.BND and EZE2DB2.DLL files.

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A VisualAge Generator Fact

Over 45 insurance companies throughout the world use VisualAge Generator.

Stay tuned! More facts are forthcoming in future issues of the newsletter.

Comment Form

Please check any appropriate boxes:

- ☐ I'd like to receive future issues of this newsletter. (You need to check this item only if you have not already responded.)
- ☐ I'd like more information about Version 2.2.
- ☐ I'd like to participate in a Beta program for the next release of VisualAge Generator.
- ☐ I'm interested in writing an article to include in *The VisualAge Generator Newsletter*.
Subject: _____
- ☐ I'm interested in participating in an AD users' group meeting.
- ☐ I'm interested in participating in a VisualAge Generator users' group meeting.

I have a question I'd like to submit for the Question & Answer section of this newsletter:

Any comments you'd like to share with us about VisualAge Generator or about this newsletter? (Include your comments or concerns about VisualAge Generator's future directions here.)

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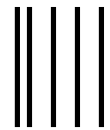
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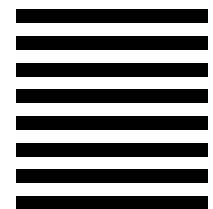
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Questions & Answers

Question: Why choose VisualAge Generator?

Answer: You should choose VisualAge Generator because it is an enterprise application development tool—not just another “pretty windows” builder. With VisualAge Generator you can do the following:

- Build one, two, three, and ‘n’-tier distributed applications
- Build scalable transaction solutions from an NT to an MVS platform
- Leverage existing application assets and provide evolving path to new object-oriented, client/server, and network-centric technologies.
- Build enterprise applications from the power of the workstation
- Build and interactively test applications without compile steps
- Perform visual dynamic application partitioning
- Choose from among the many middleware, protocols, and databases supported
- Perform true rapid application development (RAD) via Wizard Template technology
- Visually construct Windows GUIs or traditional Text User Interfaces (TUIs), or access your TUI via a Web Browser (CICS, AS/400 applications)
- Rock-solid support from IBM
- And Much, Much, More!!

Question: How do I create a GUI splash-screen using VisualGen 2.0?

Answer: You can create a GUI splash-screen that closes after a specified amount of time has elapsed by using the executeDeferred action to delay the execution of a logic member that closes the GUI splash-screen after so many milliseconds.

Question: How can I access non-IBM databases (for example, Oracle) in native mode? Is there a plan?

Answer: VisualAge Generator’s plan is to provide ODBC support in Version 3.0. ODBC will be supported in all of our native C++ platforms (AIX, OS/2, and Windows NT).

The Developer product (ITF) will also have support for running non-IBM databases via ODBC.

Question: Do you have a white-paper or technical stuff on migrating CSP applications?

Answer: Refer to *Migrating Cross System Product Applications to VisualAge Generator* (SH23-0244) for details on migrating your CSP applications to VisualAge Generator.

The VisualAge Generator Newsletter

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The VisualAge Generator Newsletter
Managing Editor
IBM Corporation
Dept. TE2/062
P.O. Box 12195
3039 Cornwallis Road
RTP, NC 27709-2195
USA
FAX: (919) 254-0206

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IBM Corporation
Dept. TE2/062
P.O. Box 12195
3039 Cornwallis Road
RTP, NC 27709-2195
USA

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