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Aviva Mainframe Edition Rel. 7.00

From 'Dumb' Terminal Emulation To Flexible Development Platform

the quiet revolution of SNA emulation software

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Abstract

This document presents the evolution that SNA emulation software has gone through over the years, from simple software mimicking ‘dumb’ terminals to sophisticated Client/Server development tools. Eicon Technology has been very much part of this ‘quiet’ revolution since the introduction of Access QLLC in the DOS environment

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The rise of terminal emulation software

When the IBM PC was introduced over ten years ago, corporations worldwide had already invested massively in IBM SNA networks. They didn't see much need for the new unsophisticated computers. Then, companies such as Lotus and Ashton-Tate made the use of spreadsheets and relational databases popular with financial analysts and traders, and PCs began to appear on the desks of large corporations. But incompatible networks forced PC users to manually re-enter printed listings from the SNA host into spreadsheets and databases.

PC terminal emulation software

Soon, companies such as DCA, Attachmate, IBM and Eicon introduced the first DOS-based terminal emulation software packages for PCs. Unlike 'dumb' terminals, PCs running emulation software allowed users to run several sessions concurrently, whether connected to the host via a Coax adapter or by other means. Also, Eicon was one of the first companies to see the need to connect PCs on a LAN to a remote SNA host or to a WAN. Eicon introduced Access/QLLC, a version of its Access emulation software capable of connecting a PC to a remote host via an X.25 connection provided by an EiconCard in the PC.

Although Eicon and others had broken the limits of traditional 'dumb' terminals[1] (local coax connection, only one session at a time), PC users were growing frustrated by the fact that they couldn't share information between their host application and popular PC software. A glimmer of hope) came in 1990 with the arrival of Windows 3.0 and Windows-compatible software. With the introduction of DDE (Dynamic Data Exchange), Windows provided interoperability between different applications running on the same PC. The Copy-and Paste function alone probably translated into productivity gains that offset the cost of new PCs running the resource hungry Windows operating system.

[1] One exception is the 3180 terminal introduced by IBM in the mid '80s, that supported five concurrent sessions. Users could shift from one session to another without being able to overlap them or copy and paste information between sessions.

At first, Windows did not bring that much benefit in terms of GUI to terminal emulation users who had to familiarize themselves with elements that were of little use in the day-to-day operation of character-based host applications. But later, with the availability of Windows 3.1 and Windows-based emulation software, and the introduction of OLE 1.0 (Object Linking and Embedding), it became possible for corporate users to create 'hotlinks' between a host application field in a windows and a spreadsheet cell or a custom finance application. Terminal emulation software vendors introduced the concepts of 'hotspots' (finally finding a concrete use for the mouse in Windows-based emulation software) and 'screen triggers', providing a means for MIS personnel to rejuvenate host application menus and screens without modifying 20 to 25 years of investment in COBOL development on the host side.

Screen Scrappers

With the maturity of the Windows environment and the introduction of popular Client/Server development tools (Visual Basic, PowerBuilder, Delphi), terminal emulation users began to look for more sophisticated ways to integrate host applications within graphical front-ends or enterprise information systems to replace the antiquated HLLAPI interface introduced as *Extended High Level Language Application Programming Interface* by IBM over ten years ago. While HLLAPI provides a standard interface to control the different elements of a terminal emulation session, it is cumbersome to use and does not provide a means to open or close sessions. For the last 3 years, third party vendors have tried to capitalize on the success of visual development tools, such as Microsoft Visual Basic and PowerBuilder, to market 'screen scrappers'.

A screen-scrapper is a run-time application that uses the terminal emulation 'connectivity engine' to connect to the host. Once the connection to the host is established, the screen scrapper application allows the developer to 'capture' (i.e. capture) host data from application screens and the commands used to navigate from one screen to the other, and produces Visual Basic or PowerBuilder forms and code.

This code is then modified using the Visual Basic or PowerBuilder visual development environment, and is integrated into a custom GUI application that will be used on the desktop instead of the regular 'black & green' terminal emulation window. The benefits of a 'screen scrapping' product are obvious: it hides the complexity of character-based applications and allows information from different sources to be combined in a single graphical application. However, the lack of maturity of client/server development tools, as well as the lack of interoperability between SNA networks and PC LANs and WANs, limited the appeal of such products until the introduction of 32-bit Windows solutions.

Eicon takes a two step approach

Aviva Mainframe Edition: a new approach to SNA on the desktop

Two years ago, Eicon decided to invest massively in the development of a new desktop-to-SNA connectivity platform that would take advantage of the new features introduced by Microsoft Windows 95, Office 95 and Windows NT. This new connectivity software had to meet the following objectives: the product had to be as easy to use as a Microsoft Office 95 application ; it had to be customizable enough to satisfy the specific needs of large corporations ; it had to make the conversion from 16-bit platforms (DOS, Windows 3.x) to Win32 environments as easy as possible ; it had to require the least training as possible for both end users and support desks. In fact, this product was to be so easy to use and customizable that, by deploying it, a corporation would ***hide the complexity of SNA host connectivity*** to the end users.

Microsoft Office Compatible

Aviva is Eicon's new 32-bit Windows SNA connectivity solution for users running Windows NT or Windows 95. Introduced in April 1996, Aviva has already won rave reviews for its ease-of-use and strong connectivity features. In particular, Aviva has been certified 'Designed for Windows 95' and 'Microsoft Office Compatible' by Microsoft[2].

Aviva shares many more features with Microsoft Office applications than the logo program requires, simply because Eicon's goal when designing Aviva was to have it blend into the user's desktop. Aviva not only shares common menu and toolbar structures with Microsoft Office, making it easier for users familiar with Excel or Microsoft Word to use Aviva, it also offers EiconBasic —a fully compliant VBA macro language, complete with dialog editor and macro debugger.

[2] To obtain the list of applications certified 'Microsoft Office Compatible', check Microsoft's Web site at http://www.microsoft.com/msoffice/ofccomp

Because EiconBasic is VBA compliant, Visual Basic developers don't need to learn a proprietary macro language. It also allows them to record SNA specific operations with Aviva, and then to copy the code generated in a custom Visual Basic application or any other 32-bit application supporting VBA, such as Excel or Microsoft Access, without changing a single line of code[3]. Note that the opposite is also true, i.e. one can move VBA code from Excel or Microsoft Access and paste it within an Aviva macro.

Aviva also shares with other Microsoft Office applications the ability to be used as an ActiveX Automation (formerly known as OLE 2.0 Automation) server or client and to control, or be controlled by, other applications. In Aviva, ActiveX Automation controls are integrated with the EiconBasic macro language, allowing developers to use the same familiar user interface to design powerful applications. Also, Aviva offers Screen Triggers and the HLLAPI programming interface, that will satisfy the needs of corporations having to support applications making use of these older APIs.

Aviva as a connectivity engine

The combined support of HLLAPI, Screen Triggers, EiconBasic, and ActiveX Automation make Aviva the perfect development platform for corporations looking to automate and streamline legacy host applications and integrate them into the end user desktop. But what makes Aviva unique is the ability to run sessions without loading the Aviva user interface. Suddenly, Aviva is no longer a 32-bit SNA emulation software, it is a ***host connectivity engine***.

End-users can now access information residing on the host without knowing that they are accessing a legacy host application. They can use the application they are most familiar with, whether it is Excel, Microsoft Access or a custom graphical front-end while, in the background, Aviva automates the process of connecting to the host and navigating through the legacy application.

[3] Some trivial changes might have to be done, e.g. the name of the application being controlled, etc. Please refer to Aviva's Programmer's Reference Guide for more details.

Loading Aviva sessions without their user interface presents two advantages. First, since the Aviva icon is not even visible on the Windows 95 Taskbar or Windows NT Program Manager, Aviva hides the complexity of SNA connectivity. Second, Aviva makes better use of system resources (see Appendix A), allowing users to run more sessions concurrently or making room for the graphical custom front ends that sit on top of them.

Aviva AutoScript and ODBC: the perfect development companion products

Aviva AutoScript

For the past 18 months, Eicon Technology has been looking for the right development tool to allow third party programmers to make the most of the powerful development capabilities present in Aviva. Eicon reviewed many 'screen scrapping' technologies without being convinced by them. That's when Eicon decided to partner with Software Development Tools Inc., a leader in Client/Server development tools, to deliver a highly functional companion product for Aviva.

Aviva AutoScript works hand-in-hand with Aviva in a Visual Basic development environment. AutoScript connects to the host using Aviva as a connectivity engine, and allows the developer to navigate through the host application screen and tag the screen areas that will be used in the final custom application. AutoScript records the commands and the logical connections from screen to screen. At the end of the navigation process, AutoScript automatically generates the Visual Basic forms associated with the tagged screen areas, as well as fully standard Visual Basic code. The developer now possesses a structured Visual Basic program that can be modified to smoothly integrate the legacy host application within a custom graphical front end.

While the AutoScript concept is both familiar and easy to understand, when combined with the rest of the Aviva product line, it constitutes a powerful and flexible way to access information. Presently, AutoScript fully supports Aviva Mainframe Edition, and will support upcoming Aviva AS/400 Edition, Eicon's 5250 connectivity solution. This will allow corporations to combine information residing on different host systems, either mainframe or AS/400, located in different geographical areas. Aviva AutoScript is currently in final beta stage[4] and will be released by the end of calendar 1996.

[4] Please contact your local Eicon representative to obtain a beta copy of Aviva AutoScript. You must sign a standard non disclosure agreement in order to have access to this product.

Aviva ODBC: a direct access to information

Along with Aviva AutoScript, by the end of calendar 1996 Eicon will release two additional products to satisfy the needs of corporations that want to bypass legacy host applications and directly access the data residing on AS/400 systems and mainframes.

Aviva ODBC/400 and ***Aviva ODBC/MVS*** are two different products targeted at system developers who want to tap the power of the IBM DB2 SQL database, whether it is DB2/MVS on the mainframe, or DB2 on the AS/400, RS/6000 or an OS/2 server. Both drivers are ODBC level 2 compliant[5], and use IBM's DRDA specification to access DB2 relational databases on SNA hosts.

Aviva ODBC drivers allow corporate users to query or modify DB2 relational databases without the need to master complex SQL commands. The ODBC interface lets users work from within their favorite desktop application, whether it is Microsoft Query, Borland dBASE or a custom application developed with Visual Basic, PowerBuilder or Delphi32. The ODBC-to-DRDA driver takes care of the underlying query translation between the ODBC-compliant application and the SQL database.

However, Aviva ODBC needs an APPC stack to connect to the SNA host. Today, Aviva ODBC works with all industry standard APPC stacks supporting the WinAPPC or EHNAPPC interfaces.

You can use the APPC stack integrated in the Microsoft SNA Server and Novell NetWare for SAA gateways, or even NetSoft's NS/Router. If you are interested in an all-in-one Eicon solution, we recommend corporate developers test Aviva ODBC and develop applications using Microsoft SNA Server or the upcoming Golden Gate release of NetWare for SAA, since the 32-bit APPC stack that Eicon will deliver in 1997 will be WinAPPC compliant (the NS/Router only provides the EHNAPPC interface).

[5] Aviva ODBC support both *the API Conformance Level 2* as well as the *extended grammar SQL Conformance*. Please refer to ODBC SDK 2.1: Programmer's Reference - MSDN Library.

Additionally, each Aviva ODBC driver will integrate a 32-bit and a 16-bit version in the same package (the 16-bit drivers also support the AS/Router available for free with Eicon Access for Windows 4.20) so a corporation can plan their own path for migrating from Windows 3.x to Win32.

Conclusion

As you can see, terminal emulation software has come a long way since the day it only performed 'dumb' terminal emulation. Today, Today, Aviva brings the benefits of Client/Server computing to the desktop, in a way that is not obtrusive for the end-users or network administrators. The Aviva product line brings benefits for all type of users: end-users can keep working with applications they are familiar while accessing the processing power and storage capabilities of SNA hosts, and system administrators and networks professionals can finally develop a robust Client/Server platform where both SNA hosts applications and desktop productivity tools work together, rather than exclude each other.

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Appendix A

Comparison test between Aviva Mainframe Edition and Attachmate Extra for allocated memory and resources

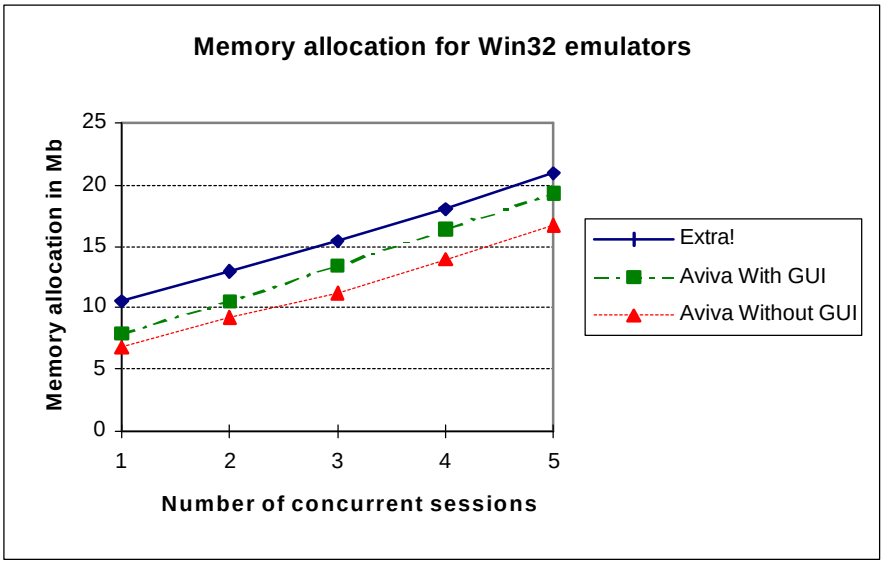
Summary: The following results have been performed with released versions of Eicon Aviva Mainframe Edition Release 7.00 and Attachmate Extra! Personal Client 6.1, on a Digital DECpc LPx 466d2 running Microsoft Windows 95, with 16 Mb of RAM and ample free disk space (150 Mb free).

ALLOCATED MEMORY

For this test, we have used the "System Monitor" utility available with Windows 95 to determine the memory used by 1 session, 2 sessions, up to 5 sessions. The test was done with Aviva Mainframe Edition (with and without user interface) and Extra! Personal Client (Extra! doesn't have the capability to disable the user interface for its sessions). The allocation of memory was not always stable so, to have more accurate results, the test was done three times and the comparison was made with the average of these three tests. In the average table, you can see the difference between Aviva and Extra! in terms of memory and percentage.

Average allocated memory

Values in Mb	**Aviva Without GUI**	**Aviva With GUI**			**Extra!**		
			-/+	**%**		**-/+**	**%**
1 Session	6.8	8.0	+ 1.2	+15.0	10.5	+ 3.7	+35.2
2 Sessions	9.2	10.6	+ 1.4	+13.2	13.0	+ 3.8	+29.2
3 Sessions	11.2	13.5	+ 2.3	+17.0	15.5	+ 4.3	+27.7
4 Sessions	13.9	16.4	+ 2.5	+15.2	18.1	+ 4.2	+23.2
5 Sessions	16.7	19.3	+ 2.6	+13.5	20.9	+ 4.2	+20.1



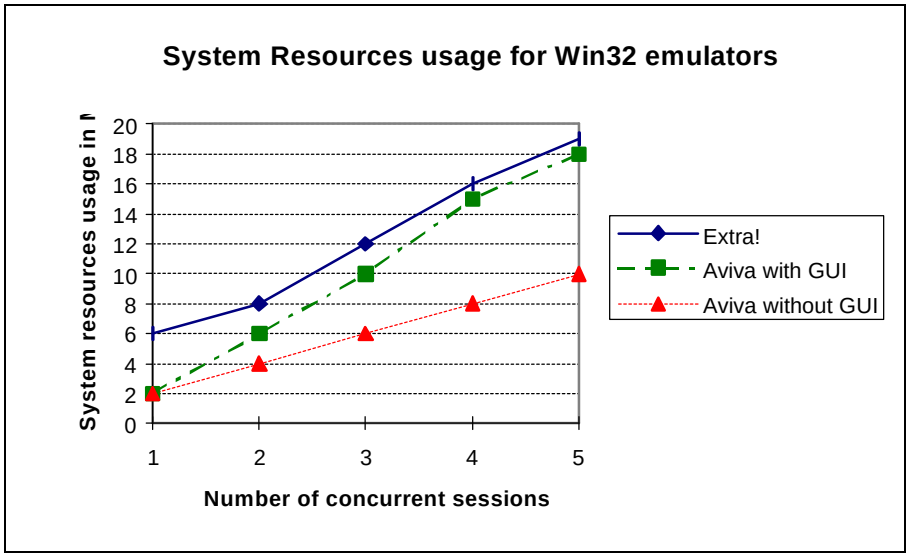
Aviva Mainframe Edition sessions make a better use of memory than Extra! sessions. For corporations looking at deploying custom graphical front ends to interface host applications by means of ActiveX Automation (formerly OLE Automation), Aviva's unique capability to disable the session's user interface provides a clear advantage over Extra! or other memory-hungry emulation software.

RESOURCES

For this test, we have used the "Resource Meter" utility available with Windows 95, and we have looked at the resources (System, User and GDI) used by 1 to 5 sessions. Since the System Resources value is a combination of User and GDI numbers, we have compiled these values and presented them in the table and graph below.

System resources

Values in %	**Aviva without GUI**	**Aviva with GUI**	**Extra!**
1 Session	2	2	6
2 Sessions	4	6	8
3 Sessions	6	10	12
4 Sessions	8	15	16
5 Sessions	10	18	19



Here again, Aviva outperforms Extra! in terms of System resources usage. While standard Extra! and Aviva display sessions make about the same usage of system resources, it is clear that if Aviva's user interface is disabled, a greater number of sessions will be able to run at the same time. This actually confirms the results of the allocated memory test (see above).