



## **White Paper**

**IBM**<sup>®</sup>

## Notices

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DB2	IMS Client Server/2
CICS	Language Environment
CICS OS/2	OS/2
IBM	

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## The PL/I Product Family, Today and In the Future

The PL/I product family is evolving to meet the growing and varied needs of application programmers and executives. IBM is trying to meet these needs by providing an application development environment that supports new application development, maintenance, reuse, downsizing, database access, transaction monitor support, and new tools, like a visual development environment.

A lot of this support is in place today. And more is on its way.

Whether you are a PL/I programmer or an executive in a company that has invested in PL/I, this paper describes some of the issues you are facing and ways in which IBM's PL/I products can help. This paper outlines our current PL/I products, some related products, and IBM's future direction for the PL/I product family.

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### The 3GL Dilemma

At one time you didn't have a choice—third-generation languages (3GL) were your only tools for commercial application development. Now you have too many choices. You can choose from dozens of combinations of new languages and methodologies. Are any of the new choices as powerful and reliable as the 3GL you have invested in over the years?

IBM is evolving the PL/I product family in such a way that you will be able to benefit from the new technologies you read about—client/server, visual development and object-oriented—and still preserve your investment in PL/I applications and skills. IBM's PL/I product family provides you with a reliable and cost effective way to introduce newer, productive technologies into your company.

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### PL/I on the Desktop

You developed your business by creating mainframe PL/I applications that call VSAM files, DB2 and IMS data, and invoke CICS transactions. But how can you use your existing mainframe PL/I applications in combination with

the new technologies? IBM now offers PL/I products for your desktop that let you visually develop the same kinds of applications for a client/server environment.

IBM introduces three new members of the PL/I product family that support visual client/server application development on a PC:

- PL/I for OS/2—Professional Edition
- PL/I for OS/2—Personal Edition
- PL/I for OS/2—Toolkit.

PL/I for OS/2 Professional Edition is a 32-bit PL/I compiler and debugger for OS/2. PL/I for OS/2 Professional Edition was designed with today's commercial application developers in mind. Following is a description of PL/I for OS/2 Professional Edition's support for the DB2, IMS and CICS product families.

PL/I for OS/2 Professional Edition includes a preprocessor that supports DB2/2 and lets you embed SQL statements in your PL/I programs. If you have a distributed database connected by DDCS/2, you can also access data stored in other DB2 products, from PL/I applications on OS/2. PL/I's database solution lets you build new client/server applications or extend the life of your existing mainframe PL/I applications.

PL/I for OS/2 Professional Edition includes a CICS preprocessor that lets PL/I programmers develop CICS applications on OS/2. CICS OS/2\* and PL/I for OS/2 Professional Edition provide powerful facilities for assisting and improving programmer productivity in the development and debugging of new applications, making PL/I for OS/2 a valuable base for development of CICS applications for running on other CICS systems.

By combining PL/I for OS/2 Professional Edition and IMS Client Server/2\*, you can access your mainframe IMS data and transactions from a more productive environment, while preserving data integrity. Developing and maintaining applications that call mainframe IMS data and transactions can be very easy with PL/I.

The PL/I for OS/2 Toolkit is a low-priced feature of PL/I for OS/2. The Toolkit includes two new tools: PM—GUIDE/2, a visual tool for building PM applications with PL/I, and a tool that con-

verts C header files to PL/I header files. PM—GUIDE/2 can be used as both a prototyping tool and a code generator for developing user interfaces.

PL/I for OS/2 Personal Edition is a 32-bit PL/I compiler for OS/2 and debugger designed for companies developing new applications on a stand-alone PC, or small LAN.

These PC additions to the PL/I product family provide a number of new choices for application developers.

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## PL/I on the Mainframe

To most people the very name "PL/I" brings up connotations of a mainframe. As a thirty-year old language that is associated with power, that's not surprising. What may be surprising to anyone who hasn't taken a good look at PL/I lately, is how well it solves today's business problems, on mainframes and PCs.

On the mainframe, IBM offers a number of products including:

- DOS PL/I for VSE
- OS PL/I
- PL/I MVS & VM.

PL/I MVS & VM is the only one of these products that is enabled to Language Environment\* /370 (LE/370).

LE/370 is an important part of IBM's mainframe 3GL strategy. LE/370 provides a common run-time environment across PL/I, COBOL and C. Some advantages of PL/I MVS & VM with LE/370 include:

- Flexible run-time options
- FETCH for CICS and CMS
- Faster and easier interlanguage communication support (ILC)
- Dynamic ILC for all systems and subsystems
- A common condition handling architecture

These functions and, in particular, the interlanguage communication support provided by LE/370, allow mainframe PL/I programmers to reuse code. By being enabled to LE/370, PL/I MVS & VM can minimize new development and make it easier to share code between applications. This reduces the cost of PL/I application

development, test, and maintenance while helping to improve code quality.

PL/I MVS & VM is IBM's strategic mainframe product as it is enabled to LE/370 and will soon be supported by CODE/370. All new enhancements to PL/I on the mainframe will be made to PL/I MVS & VM.

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## Benefits of the PL/I Product Family

The PL/I product family provides a rich application development environment that lets you take full advantage of your existing investment and at the same time, helps to move you toward new technologies. Some of the significant benefits that the PL/I product family offer are:

- A high-productivity, visual programming environment on OS/2
- A common run-time environment across mainframe 3GL languages
- Powerful debugger technology on all platforms
- Client/server architecture
- Cross-platform portability and flexibility
- Easy access to DB2 and IMS data from the mainframe or the PC
- Mainframe or PC-based CICS transaction processing
- Preservation of existing applications
- Lower long-term development costs.

The single greatest benefit of the PL/I product family is that the strength of the language is extended from the mainframe to the desktop in such a way that the power you are accustomed to is preserved, and the productivity gains that you want are achieved.

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## Tools that Improve PL/I Programmer Productivity

Because we understand that your application development environment can be very complex, we are working to provide tools that make PL/I application development and maintenance easier. Some of the tools that currently improve programmer productivity are the WITT and ReDiscovery product families.

Application developers can use the Workstation Interactive Test Tool (WITT™) as the GUI test tool that automatically facilitates the creation of reusable unit test, function test, system test and regression test cases. New WITT offerings are now available to support X/Windows for AIX, SUN and HP, MicroSoft Windows 3.1, and OS/2.

Application developers can reuse code to minimize new development and enable code sharing between applications. This reduces the cost of application development, test, and maintenance while helping to improve code quality. The ReDiscovery product family facilitates the introduction of a reuse initiative into your development by cataloging reuse parts/modules, therefore improving productivity.

IBM is working on other facilities to improve programmer productivity. A common LAN library and dictionary services are examples that will allow for common usage of data and team programming at the workgroup level.

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## Future Directions

IBM has additional functional enhancements planned for the PL/I product family. We also intend to increase other products' support for the PL/I product family.

Some of our most immediate efforts include:

- CODE/370 support for editing, compiling, and debugging IBM PL/I MVS & VM applications in LE/370.
- LE/370 support for multitasking under PL/I MVS & VM. This support will provide compatibility with the existing OS PL/I V1 and V2 applications running on MVS.
- Providing a PL/I for AIX development environment and tools which will allow you to develop and run PL/I applications on the RS/6000.
- Integrating with VisualAge to allow parts created in VisualAge to be PL/I.

We are also investigating the feasibility of the following:

- Build on the data types in PL/I for OS/2 to provide more complete object-oriented constructs. Provide an object-oriented development environment that lets programmers develop PL/I applications using object-oriented extensions and object libraries containing PL/I specific function.
- Add a set of tools that make development of object-oriented PL/I for OS/2 programs quick and easy, such as a graphical browser, an object-oriented environment interface, and a visual builder.
- Add support for the System Object Model (SOM) libraries to PL/I for OS/2.

The PL/I product family will continue to evolve as IBM invests in technologies and tools that help programmers extend the life of existing PL/I applications, and develop new PL/I applications more rapidly.

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## Summary

We recognize the complex and varied needs of PL/I customers. You are running critical parts of your business on applications that were written in PL/I, as many as thirty years ago. You need to maintain this code. You also need to develop new applications. You read great things about the productivity gains offered by newer languages, methodologies and technologies. IBM would like to deliver these productivity gains in the form of something you know and trust.

Today the PL/I product family offers an extensive set of mainframe and PC products that can improve your existing application development environment. We will continue to assess the evolving needs of PL/I programmers and strive to provide you with products that meet these needs.

