PHAR LAP TNT DOS-EXTENDER SDK

Break the 640K Barrier and Get GUI Power for your 32-Bit DOS Applications

Windows GUI power with 32-bit DOS!

Phar Lap's TNT DOS Extender lets you build a Windows graphical user interface (GUI) for your 32-bit DOS extended applications without having to rewrite the entire program! Using Microsoft's Visual Basic, you can quickly and easily create a Windows front end while keeping your 32-bit extended DOS engine. For developers with "legacy" programs or for those who want the look of Windows without the time-consuming effort of writing a new API, Phar Lap's TNT is the answer!

NT power under 32-bit DOS!

TNT lets you use Borland C++ 4.0 or Microsoft Visual C++ 32-Bit Edition to bring unprecedented power to 32-bit DOS! Break the 640K DOS barrier, build multi-megabyte applications, and take advantage of powerful Windows NT features like threads, DLLs, and multitasking. You can do all this with TNT DOS-Extender. Just use TNT DOS-Extender under DOS with Borland C++ 4.0 or Visual C++—your standard, familiar compilers—to create 32-bit DOS programs with cutting-edge NT power. The future of 32-bit DOS is finally here!

TNT DOS-Extender supports a subset of Win32 API under DOS, so you can write native Windows NT character-based programs that run with no changes under DOS. Because TNT DOS-Extender runs the Visual C++ compiler under DOS as well, you do not even need an NT system to build 32-bit TNT applications. You can debug with the 32-bit version of Microsoft's CodeView included in the TNT DOS-Extender Software Development Kit (SDK) or with Borland's Turbo Debugger. With these tools, you can build applications that access all the memory available in your machine—up to four gigabytes!—and run with 32-bit speed and power.

Advanced features of TNT DOS-Extender

DLLs

TNT DOS-Extender supports dynamic link libraries (DLLs), a technique for dividing large applications into smaller modules. Programs built with TNT DOS-Extender can be distributed as DLLs, which can then be loaded by other applications. DLLs provide a simple way to write add-on products for existing applications.

Threads

TNT DOS-Extender supports threads, allowing multitasking within an application. The capability to use threads to perform multiple tasks, such as carrying out user command while

running time-consuming calculations in the background, enables developers to write more responsive applications. Threads have previously been available only under high-end 32-bit environments such as OS/2 2.0 and Windows NT.

32-bit CodeView and Turbo Debugger Support

The TNT DOS-Extender SDK supports Borland's Turbo Debugger and includes a 32-bit version of Microsoft's popular CodeView debugger. Finally your familiar, powerful debuggers are available for 32-bit DOS programs.

Virtual Memory

Phar Lap's 386|VMM virtual memory manager enables programs to access more memory than is physically available. 386|VMM is an add-in driver for TNT DOS-Extender that provides demand-paged virtual memory capabilities to Extended-DOS applications. When the size of the program exceeds physical memory, unused code and data are swapped to the hard disk as necessary.

What the experts say…

> "We used Phar Lap's TNT DOS-Extender to build both our 16-bit Visual C++ and our Visual C++ 32-Bit Edition tools. TNT DOS-Extender provided the high quality and 32-bit performance we needed to deliver these powerful compilers. It's a great tool for anyone interested in 32-bit DOS development."
> **Dennis Gilbert, Microsoft**

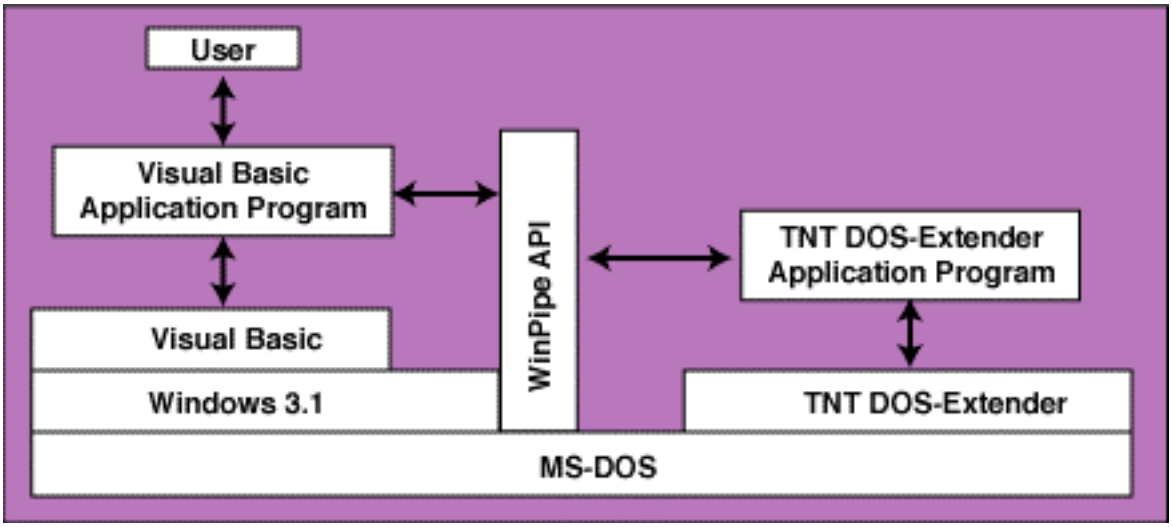
> "We chose Phar Lap's 386|DOS-Extender to build AutoCAD 386 because it was, and still is, the highest-quality 32-bit DOS extender available. Using 386|DOS-Extender has made AutoCAD 386 the top-selling AutoCAD version. We highly recommend Phar Lap's products for ADS and ADI developers who want to build high-powered AutoCAD add-ons."
> **Robert Wenig, Autodesk**

> "Interleaf has long recognized Phar Lap's visionary role in the DOS marketplace. I continue to believe that Phar Lap produces the finest 32-bit DOS extender available. Over the last five years, I've worked closely with the Phar Lap engineers, and I consider them to be among the finest in the industry."
> **Bill Hawkins, Interleaf**

GUI POWER for your 32-bit DOS Applications

Use Microsoft's Visual Basic to create a Windows GUI front end

TNT DOS-Extender lets you use Visual Basic to quickly and easily create a user-friendly Windows front end. Phar Lap's WinPipe VxD (virtual device driver) is a collection of routines that allows a Windows GUI program to communicate with a TNT DOS-Extended application.



Take full advantage of your PC's 32-bit capabilities

TNT DOS-Extender runs your program in protected mode, turning DOS into a true 32-bit operating system with a flat, unsegmented address space. Your programs can access all the memory in the machine—up to 4 gigabytes! TNT DOS-Extender functions as a layer between your program in protected mode and DOS in real mode, automatically handling system calls, switching modes and moving data between the real and protected mode address spaces. Applications use the normal DOS or NT system calls, which are caught and handled by the DOS extender, making TNT DOS-Extender transparent to the Extended-DOS application.

Compatibility

TNT DOS-Extender is only present while your application runs. In this way, it creates no overhead, and allows all your other programs to run undisturbed. Because DOS continues to operate normally in its natural environment—entirely in real mode—both TNT DOS-Extender and your Extended-DOS application are completely compatible with every DOS-based program.

TNT DOS-Extender is fully compatible with terminate-and-stay-resident (TSR) utilities and network managers. In addition, it is fully compatible with Microsoft Windows 3.1 Standard and Enhanced modes, Windows NT, OS/2 2.1, Quarterdeck's DESQview 386, and all EMS emulators that support the Virtual Control Program Interface (VCPI), including Quarterdeck's QEMM-386, Qualitas' 386MAX, Microsoft's EMM386, and Compaq's CEMM.

TNT DOS-Extender runs on any DOS-based 80386, i486 or Pentium PC and supports DOS Protected Mode Interface (DPMI) standard, which allows your Extended-DOS applications to run in multitasking environments such as Microsoft Windows 3.1, Windows NT, and OS/2 2.1

Protected Mode Solutions

Anything you can do in a real-mode DOS program—and much more—can be done with TNT DOS-Extender. Here's how TNT DOS-Extender handles some protected mode programming issues:

Direct Hardware Access

TNT DOS-Extender applications can access all hardware just as programs do in real mode—by using the IN and OUT instructions to read and write I/O ports. TNT DOS-Extender also allows applications to map physical memory from anywhere in the 4GB address space into LDT segments. This enables programs to directly address memory mapped hardware devices, even from a high-level language.

Interrupt Handling

TNT DOS-Extender provides system calls enabling applications to install hardware interrupt handles. Because hardware interrupts can occur in both protected mode and real mode, these system calls allow handlers to gain control in protected mode, real mode, or both.

Mixing Protected and Real Mode Code

TNT DOS-Extender allows you to mix protected and real mode code in the same application. This enables you to use existing real mode object libraries—such as graphics libraries—for your protected mode applications.

TNT DOS-Extender: The Right Choice

Flexibility to suit your programming needs

TNT DOS-Extender offers several flexible options for 32-bit DOS programming. It is the only DOS extender to support the Win32 API, making it possible for application developers to utilize NT features and NT DLLs under DOS, and for tools developers to make DOS versions of NT tools. Phar Lap offers two ways to build programs with TNT DOS-Extender; developers determine the desired Style at link time.

DOS Style

This mode is completely backwards compatible with previous versions of Phar Lap's 386|DOS-Extender. Programs can make DOS calls using the standard INT 21h API. All libraries, utilities and other products that support 386|DOS-Extender are also compatible with TNT DOS-Extender for DOS Style programming. A wide range of 32-bit compilers, including Borland C++ 4.0, Microsoft Visual C++ 32-Bit Edition, MetaWare High C/C++, and Watcom C/C++32 are supported. Dynamic link libraries can be implemented with any compiler that supports DLLs.

NTStyle

This mode enables programmers to call the KERNEL32 subset of the Win32 API, and implement threads, DLLs, and multitasking. TNT DOS-Extender loads the Windows NT PE (protected-mode executable) files produced by the Visual C++ 32-Bit Edition compiler, allowing developers to use a familiar Microsoft compiler for 32-bit NTStyle DOS development.

No matter which style API best suits your development needs, your TNT DOS-Extender program runs in 32-bit protected mode with access to all the memory available in your PC.

With a Phar Lap 32-bit DOS-Extender, your program could run:

Compared to 16-bit version	Product, Company
4 times faster	IsSpice/386, Intusoft
4-5 times faster	ASE, Sofistik GmbH
Up to 5 times faster	VISEM/VISUM, PTV Software und Consulting
6 times faster	MASTERSAP/386, Studio Software AMV
7–10 times faster	SuperChems, Arthur D. Little, Inc.
8 times faster	C-MOLD, AC Technology
8–10 times faster	BLAST, BLAST Support Office
Up to 10 times faster	HALO Professional, Media Cybernetics
Up to 10 times faster	STEELFAB, SCIA N.V

Products above use 386|DOS-Extender for 32-bit power.

Why would I use a 32-bit environment?

Memory

With 32-bit addressing, 386, 486, or Pentium hardware is physically capable of accessing 2^{32} = 4GB of RAM. 16-bit addresses can access only 2^{16} = 64KB in one segment.

Speed

Using 32-bit registers and a flat-memory model can dramatically improve program speed. A 32-bit program often runs many times faster than a 16-bit version of the same program. Developers typically see a 20% reduction in code size and a 50% increase in speed when moving from 16-bit to 32-bit programming.

Flat address space

A 32-bit environment uses a workstation-like flat memory model, providing access to one four-gigabyte block of extended memory. This greatly simplifies porting workstation products to the PC. A 16-bit environment can only provide access to memory in 64KB segments, slowing program execution and making PC versions of workstation programs impractical.

32-bit math

32-bit calculations will greatly improve the performance of math-intensive applications. The 32-bit environment on a 386 or higher PC is fast enough to handle heavy-duty number crunching as efficiently as a workstation.

Ordering Information

TNT DOS-Extender Software Development Kit (SDK) $995

- TNT DOS-Extender
- Microsoft CodeView 32-bit debugger
- WinPipe VxD
- 386|ASM 32-bit assembler
- 386|LINK 32-bit linker
- 386|LIB 32-bit librarian
- Phar Lap 386|SRCBug source-level debugger

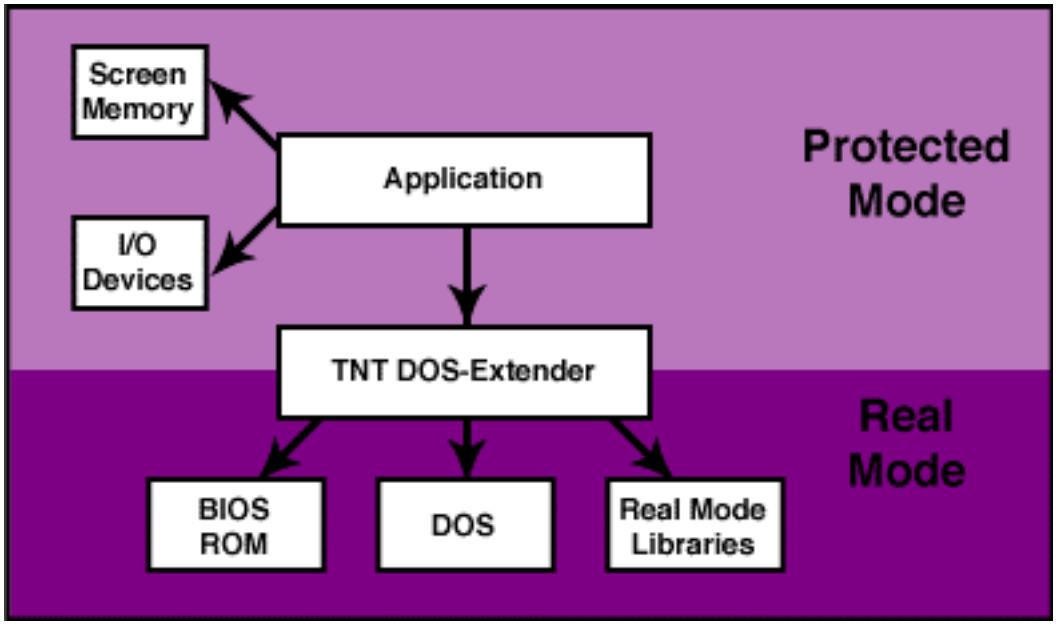
TNT DOS-Extender Run-Time Kit (RDK)

The TNT|DOS-Extender Run-Time Kit enables developers to ship a product containing TNT DOS-Extender. The RTK is distributed with a binder utility which is used to embed the DOS-Extender in a protected mode application, resulting in a “bound application,” which can be run directly under DOS.

Quantity Distributed	Fees
First 1000 copies	$1995.00
1000+ copies	$10, or 2% of the retail price of “bound product” per copy, whichever is greater.

*Special RTKs are available for high volume applications. 386|VMM Run-Time Kit also available. Please call Phar Lap for details.

Extended-DOS application organization:



Just a few of the companies choosing Phar Lap's 32-bit technology:

Company	Product:
Access Software	LINKS 386 Pro
Alsys, Inc.	Alsys Ada 386
Autodesk, Inc.	AutoCAD 386
Cadkey, Inc.	CADKEY
Hewlett-Packard	HP ME10d
Interleaf	Interleaf 5 for DOS
Intergraph Corp.	MicroStation PC
Microsoft Corp.	FORTRAN PowerStation
Microsoft Corp.	FoxPro 2.5 for DOS
Microsoft Corp.	MASM 6.1
Microsoft Corp.	Visual C++ (16-bit)
Microsoft Corp.	Visual C++ (32-bit Edition)
The MathWorks	MATLAB
Wolfman Research	Mathematica
The Dini Group La Jolla, Inc.	High Speed Digital Design products

Phar Lap Software

Phar Lap Software, founded in 1986, is also the developer of the award-winning 286|DOS-Extender, which enables customers to develop multi-megabyte 16-bit protected mode DOS applications using their standard Microsoft C/C++, Borland C++, or Microsoft Fortran compilers. As an industry leader, Phar Lap is actively involved in designing and implementing

DOS extender technology standards. Phar Lap is the co-author of the award-winning VCPI standard and is a member of the committee that designed the DPMI standard.