

**ALTERA®**



**SOPC**  
**WORLD**  
2 0 0 2

**Unitying** the Desktop and Target

# Accelerated Technology, Embedded Systems Division of Mentor Graphics

Accelerated Technology Korea  
([www.acceleratedtechnology.co.kr](http://www.acceleratedtechnology.co.kr))

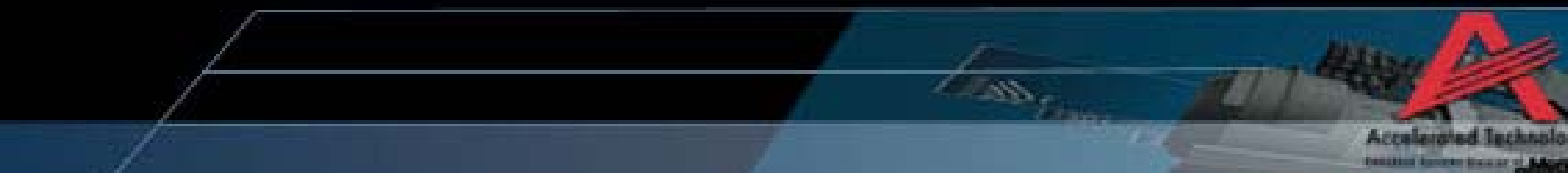
2002. 11. 6.

Accelerated Technology, Embedded Systems  
Division of Mentor Graphics



# Mentor Graphics

- Publicly Held: (NASDAQ: MENT)
- Founded 1981: HQ in Wilsonville, Oregon
- 3,700 Employees
- Revenues of \$600M Annually
- World-Class R&D
- 53 Locations Worldwide
- Only EDA Company with Embedded Software Focus
  - World-class embedded RTOS
  - Embedded Development Tools
  - Co-verification market leadership
  - Acquisition of Accelerated Technology strengthens this position further



# Mentor Increasing Commitment to Embedded Systems

- Larger organization to help embedded systems division grow its product offering and market share
- Increased funding for Accelerated Technology products
- Experienced management team

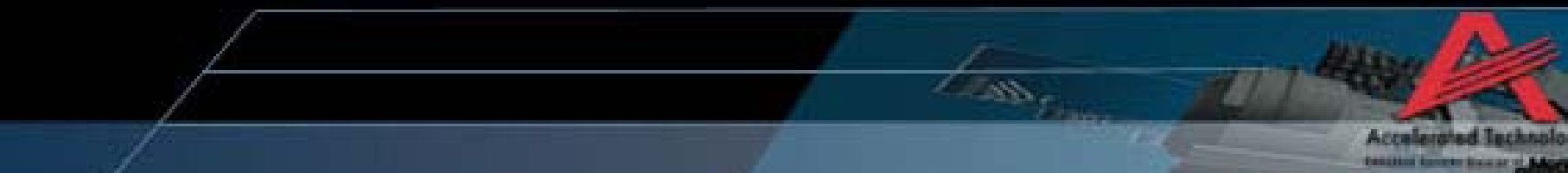
*Mentor chose **Accelerated Technology Inc.** to provide them with the investment to dramatically increase embedded software support*



# The Vision

## As Mentor's Embedded Systems Division:

- Use the existing world class RTOS and tools technology to offer a unified desktop and target environment
- Give a better RTOS development environment for a royalty free RTOS than is offered by royalty- bearing RTOSs
- Continue to develop and enhance the Nucleus RTOS
  - Port to new processors and platforms
  - Provide extensive middle-ware
  - Support for new and emerging standards

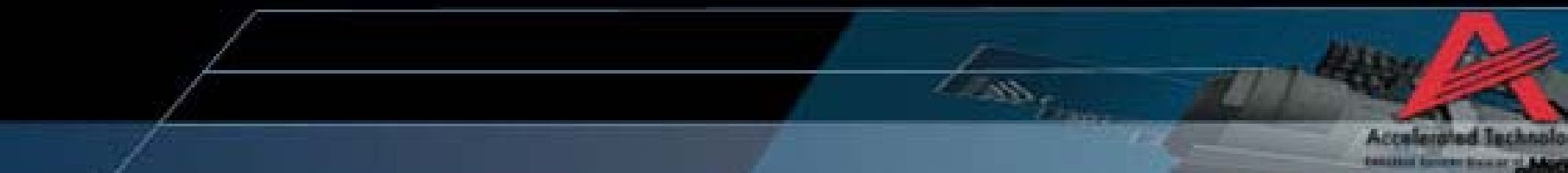


# Accelerated Technology

Mentor Graphics' Embedded Systems Division

*"In a simple statement, **all products** customers are using now from the combined companies will continue to be **maintained and improved.**"*

Neil Henderson,  
General Manager,  
Embedded Systems Division



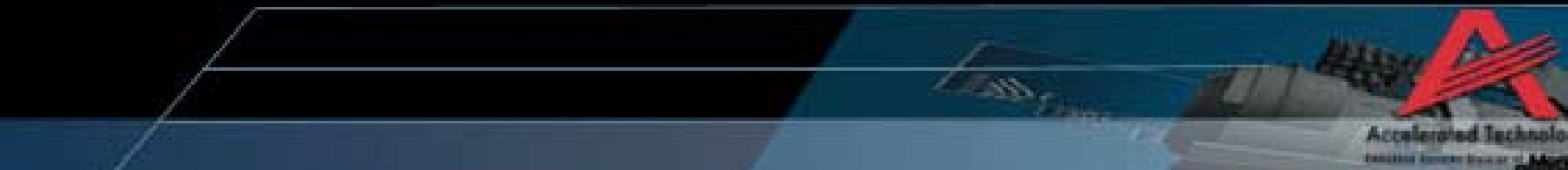
# Embedded Software Products

- Nucleus RTOS
  - Source Based Royalty Free
  - Large user-base and wide processor support
- code|lab EDE and code|lab Debug
  - Integrated development environment for embedded
  - Based on industry standard look and feel
  - Extensive connections and compiler support
- XRAY debugger
  - First embedded systems debugger
  - Multi-core support
- Microtec compilers
  - Optimizing C/C++ cross compilers
  - Intelligent linker allows most efficient use of C/C++

# Nucleus Software Credentials

*"Nucleus Software supports the most popular processors used in embedded applications being developed by our important customers, making Nucleus a proven solution."*

- Key Embedded Markets
- Korean Customer Applications

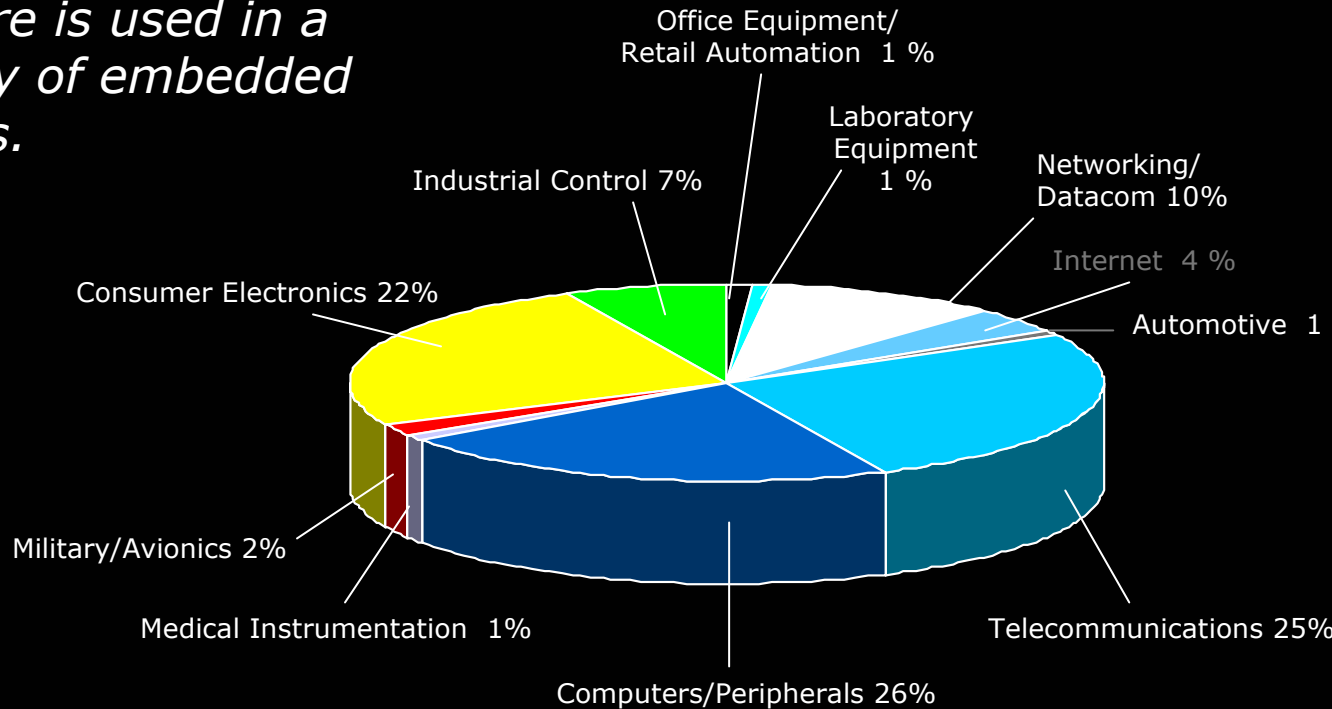




# Key Embedded Market



*Our software is used in a wide variety of embedded applications.*



*\* Nucleus and code|lab Customer Design Wins for 2001*

# Korean Customer Applications

**“ Korean Customers implemented important embedded applications using Nucleus RTOS .”**

**PDA -- SH2, ARM7, ATMEL**

**PBX -- MPC860, MPC850, ARM7**

**Base Sys of Cell Phone -- i960Cx**

**CDMA Phone -- ARM7, ARM9**

**IMT-2000 Phone -- ARM9, SA1110**

**Fast Ethernet Card -- MIPS, i960**

**Car Navigation -- 68328, ARM7**

**GPS Terminal -- 68360, ARM7**

**Satellite Sys. -- 80186, i960Cx**

**PLC Control -- 80186, ARM7**

**Web Phone -- ARM7, SA1100**

**ISDN Phone -- ARM7**

**GSM Phone -- ARM7, TriCore, C166**

**VoIP Gateway -- ARM7, MPC850,  
MPC860**

**Bluetooth Gateway -- ARM7, SH3**

**Bluetooth Cordless Phone --  
ATMEL**

**FingerPrint -- ARM7, SA1110,  
XScale**

**Key Phone -- ARM7, MPC860**

**DVD -- CIRRUS, MIPS, NEC,  
80186, ARM9**

**WLL/Router -- i960Cx, MPC860  
w/CDMA -- ARM7, ARM9**

**SmartPhone - ARM9**

**IMT-2000 Modem -- ARM7**

**IMT-2000 Base Sys. -- ARM7**

**Digital Camera -- ARM7, ARM9**

**ITS -- ARM7, ARM9, MCORE**

**Gas Control -- 80386Ex**

**xADSL/VDL -- ARM7**

**DSTB -- MIPS, 68360, NEC, ARM9**

**CableSTB -- MIPS.**

**Home PNA -- ARM7, MPC860**

**Elevator -- 80186, i960**

**VoIP Phone -- ARM7, ARM9**

**DTV -- 68360, ARM7, C166**

# Customers Who Benefit...



3COM  
Network Peripherals  
Canon Corporation  
Silicon Graphics  
LAN Access Corporation  
Ford Motor Company  
Siemens  
Texas Instruments  
IBM

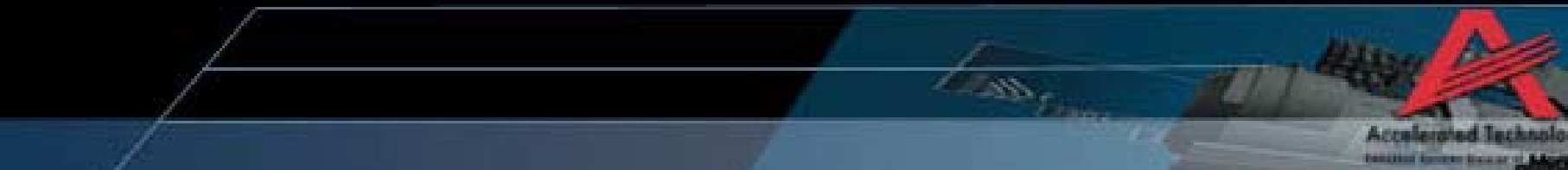
Nortel Networks  
Navionics  
Hitachi  
Lucent Technologies  
Bose  
General Motors  
Infineon Interface  
Systems  
Honeywell  
Fujitsu  
Eastman Kodak  
GE Medical  
Toyota  
Motorola  
Compaq Computers  
Sony

NEC  
General Electric  
Xerox  
Globespan  
Samsung Electronics  
Allied Signal  
John Deere  
Kenwood



# Nucleus RTOS

All you need in an RTOS.  
Royalty Free.



# Nucleus. Embedded Software.

*All You NEED in an RTOS. Royalty Free.*

- Complete Product Line
- Vast CPU Support
- Royalty Free Business Model
- Source Code
- Scalable
- Proven

## Kernels

Nucleus PLUS  
Nucleus uiPLUS  
Nucleus OSEK  
Nucleus MMU  
Nucleus DDL  
Nucleus COM  
Nucleus CAN

## Prototyping

Nucleus MNT

## Profiling

Nucleus ProView  
SurroundView for Nucleus

## C++

Nucleus C++ BASE  
Nucleus C++ PLUS  
Nucleus C++ NET  
Nucleus C++ FILE

## Network Stack

Nucleus NET  
Nucleus PPP  
Nucleus NAT  
Nucleus SSL

## Network Management

Nucleus SNMP  
Nucleus RMON  
Nucleus SPAN

## Internet Connectivity

Nucleus WebServ  
Nucleus Extended Protocol Pkg.  
Nucleus EMAIL (SMTP, POP3)  
Nucleus DHCP Server  
Nucleus Sntp Client

## Java Technology

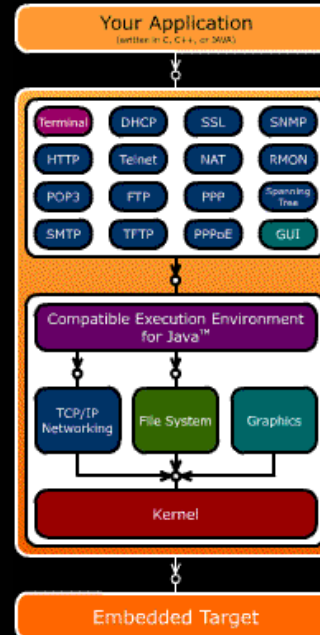
CEE-J (Virtual Machine for Embedded Devices)

## Graphics

Nucleus GRAFIX  
(Rendering Services/Windowing Toolkit)

## File System

Nucleus FILE



## Terminal Application

Nucleus SHELL

# Processors Supported

## 68K

680x0  
683xx

## X86

Real Mode  
Protected Mode

## ARC

## ColdFire

CF52xx  
CF5307  
CF5407

## DSP

Analog Devices 21161  
Share EZ  
Texas Instruments  
TMS320CS4x

## i960

## Tensilica

T1020  
T1030  
T1040

## ARM

ARM Limited  
6/7/9  
(ARM and Thumb)

Atmel  
40400  
40807  
55800  
63200

Cirrus Logic  
71111  
72xx  
7312

Hyundai  
GMS C30

Intel  
SA110-285  
SA1110  
Xscale

Samsung  
50100  
41000  
41100  
4125  
8946

Texas Instrument  
TI925

## MIPS

MIPS Technologies  
ATLAS/4Kx (Jade)

IDT  
30xx  
32334  
46xx  
4700  
5000  
503x

Lexra

LX4180  
LSI Logic  
LR33000

MiniRisc CW 40xx  
TinyRisc 410x

NEC  
VR41xx  
VR4xxx

NKK  
NR 4650

QED  
RM700  
SEAD/4Kx (Jade)

Toshiba  
TX3904F  
TX3927

## PowerPC

PowerPC 40x  
PowerPC 5xx  
PowerPC 60x  
PowerPC 7xx  
PowerPC 8xx  
PowerPC 8240  
PowerPC 8260

## Hitachi

H8  
H8/300M  
H8/2000  
SH  
SH-1  
SH-2  
SH-3  
SH-4  
SH2-DSP  
SH3-DSP  
SH-3 SE  
SH-4 SE

## M•CORE

2001  
2107

## National Semiconductor

CR16A/B/C  
CR43A

## Mitsubishi M16

C/62  
C/80

## NEC V8xx

V821  
V830  
V850  
V851  
V852  
V853

## Infineon

C167  
TriCore

## SPARC

Altera Nios  
C-Cube 2151  
C-Cube 9315  
TS704

# Licensing Models – Single Application



- **Standard Single Licensing Model**
  - Source Code provided on all Nucleus products
  - No Royalties charged on all embedded software
  - One-time License Fee  
(development and unlimited production)
- **Single Application License Grant (3 primary factors)**
  - One embedded application  
(defined by single product part number)
  - One development facility
  - One processor





# Licensing Models – Standard OEM

- **Standard OEM Licensing (Semiconductor Mfg)**

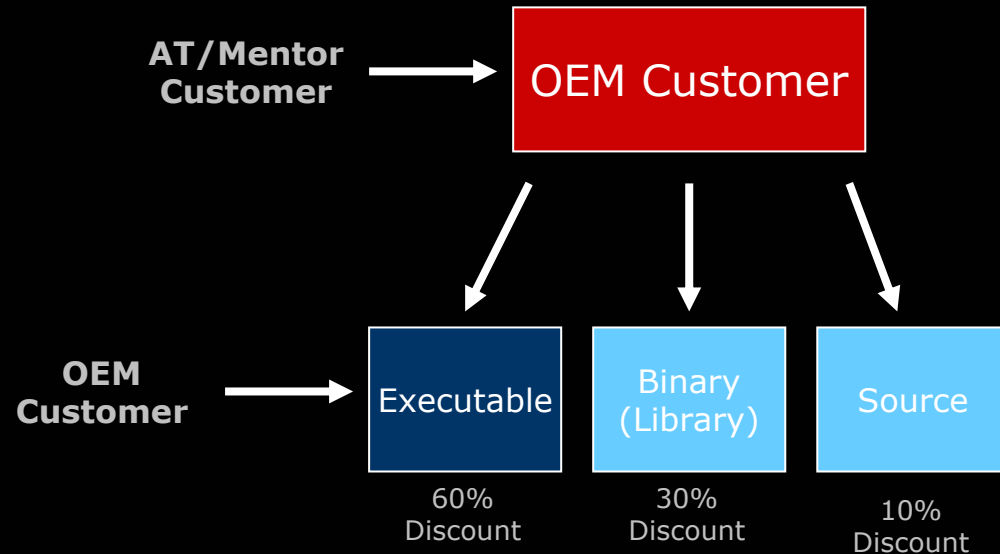
- Source Code
- No Royalties
- One-time License Fee (3x multiple)

- **OEM License Grant**

- One embedded product “family”
- One development facility
- One processor

- **Sublicensing Rights**

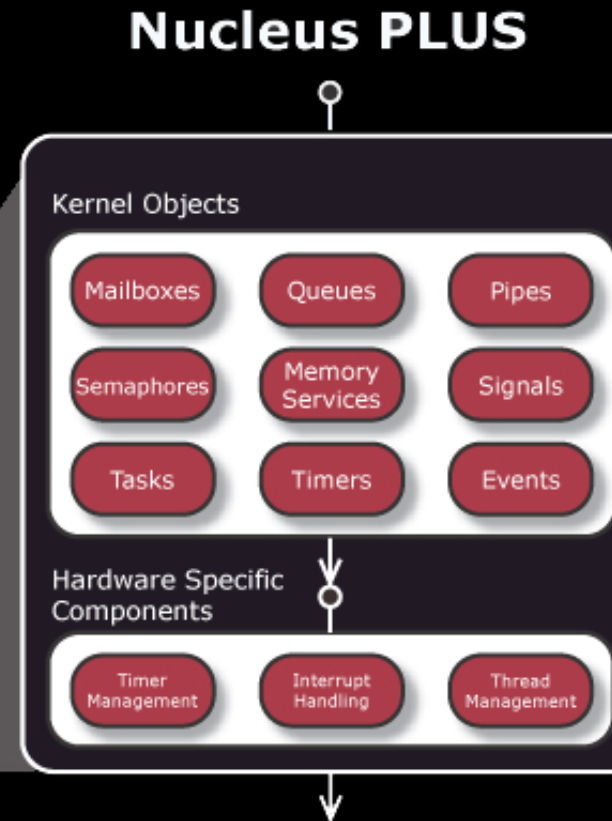
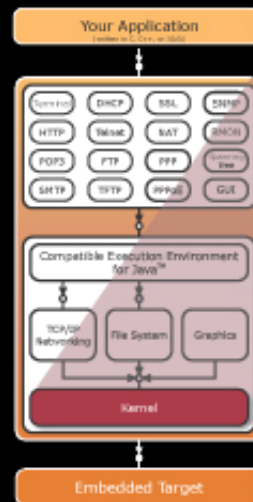
- Source Code
- Object/Binary Code
- Executable





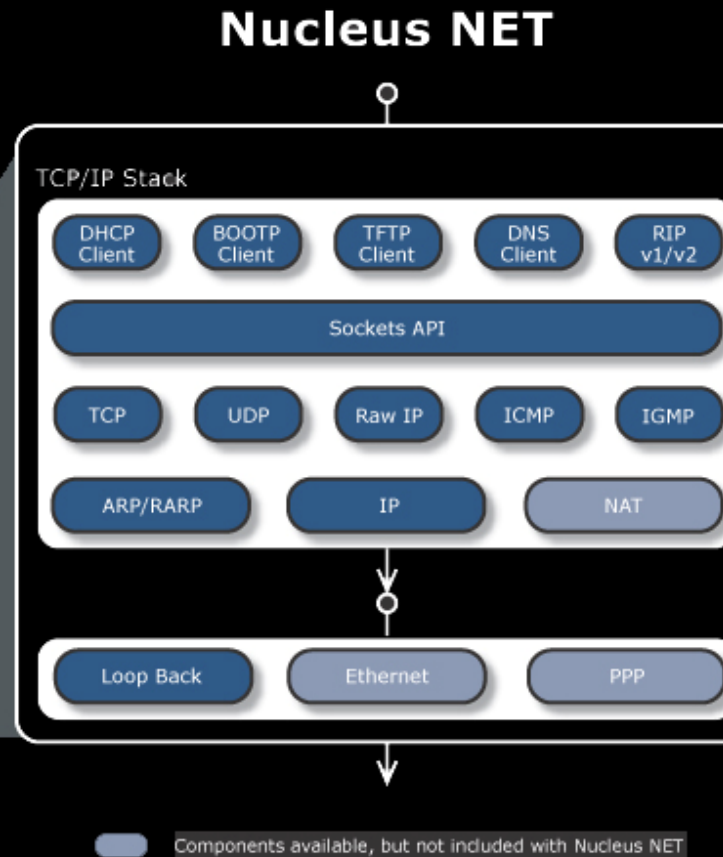
# Nucleus PLUS

- Multitasking real-time kernel
- Priority, pre-emptive scheduler
- Inter-task synchronization (semaphores, signals, events)
- Memory Management (fixed or variable)
- Dynamic creation/deletion of all objects



# Nucleus NET

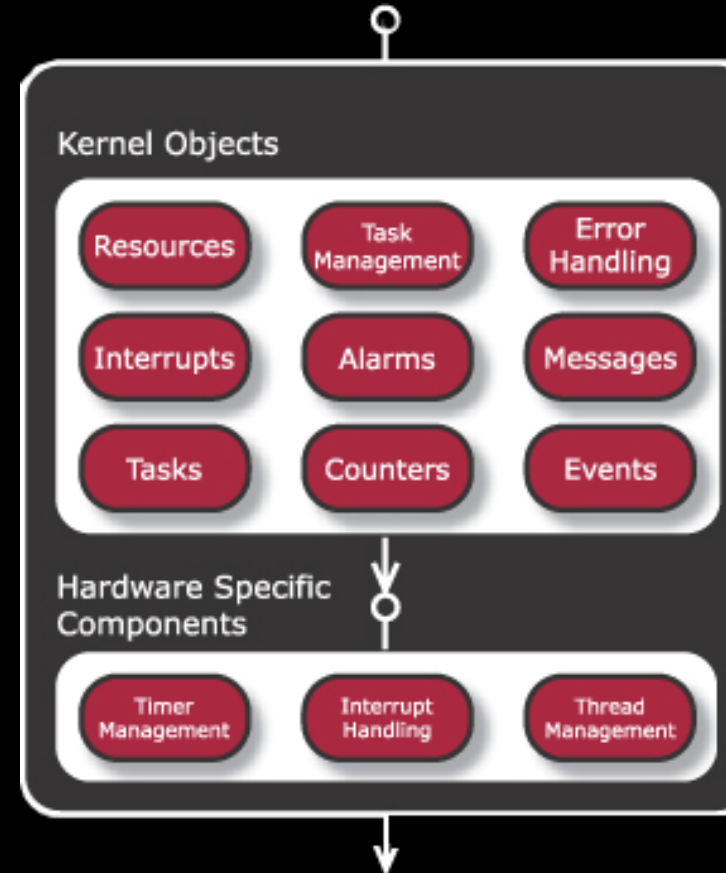
- TCP/IP Protocol Stack
- Protocols supported: BOOTP, UDP, TCP, ICMP, ARP, RARP, DNS, DHCP, IGMP, TFTP Client, RIP/RIPII
- Optional Components: PPP, Ethernet Drivers
- Minimum data copies
- Tightly integrated with Nucleus PLUS for optimal performance



# Nucleus OSEK

- User-definable hook routines for error-handling and debugging
- Scalable, reliable, ROMable, and cost-sensitive operating system
- Low-level memory resource usage
- Support for all four conformance classes
- Mixed-preemptive scheduling method
- Resource and event management synchronization mechanisms
- Variant relative and absolute alarms

## Nucleus OSEK

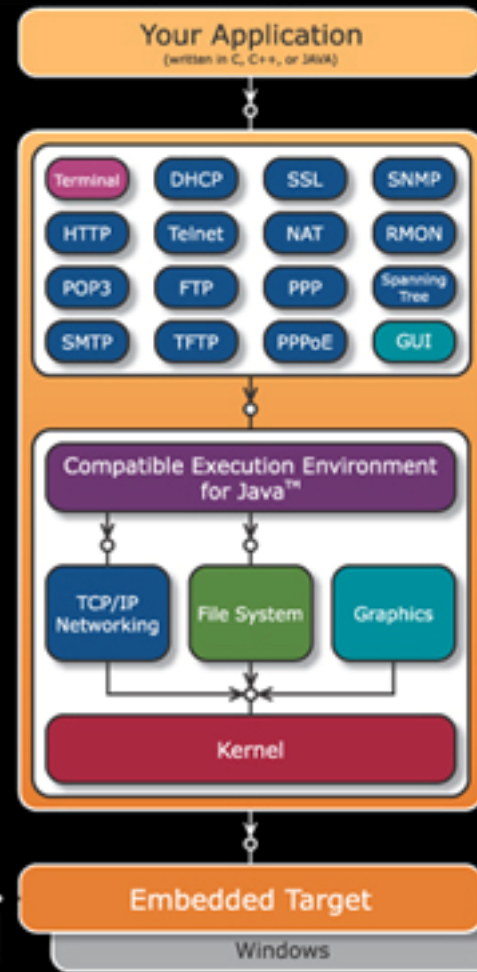
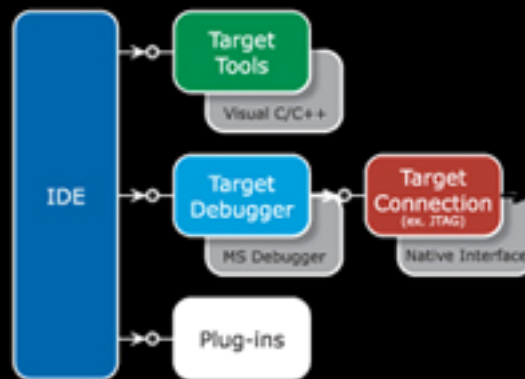


# Nucleus MNT

- Every Nucleus Embedded product is available in Nucleus MNT environment:

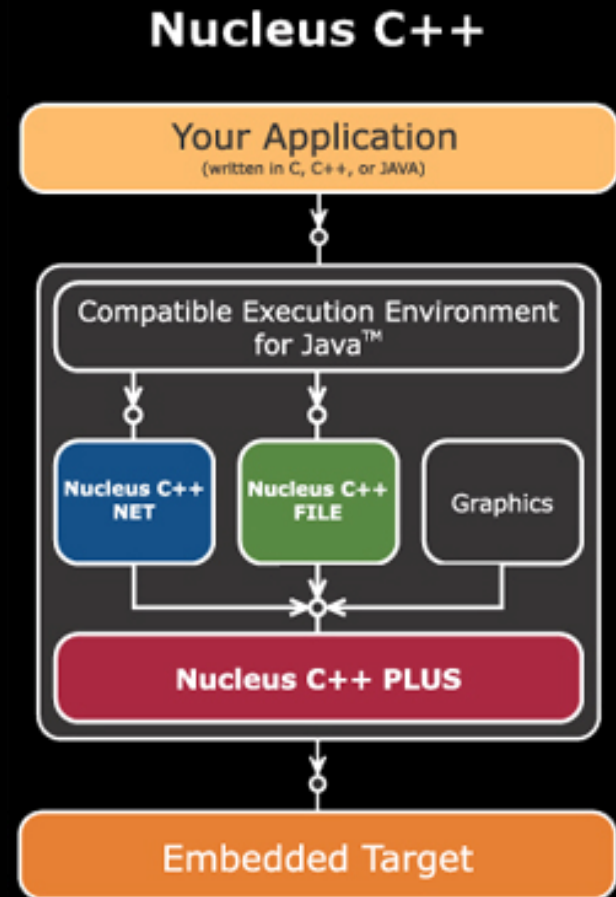
Nucleus PLUS for MNT  
Nucleus NET for MNT  
Nucleus GRAFIX for MNT  
Nucleus WebServ for MNT  
Nucleus FILE for MNT  
Nucleus C++ for MNT

- Common API for Nucleus MNT and Target versions of Nucleus Products
- Based on Microsoft Visual Studio™
- Speeds development process while decreasing your time to market.



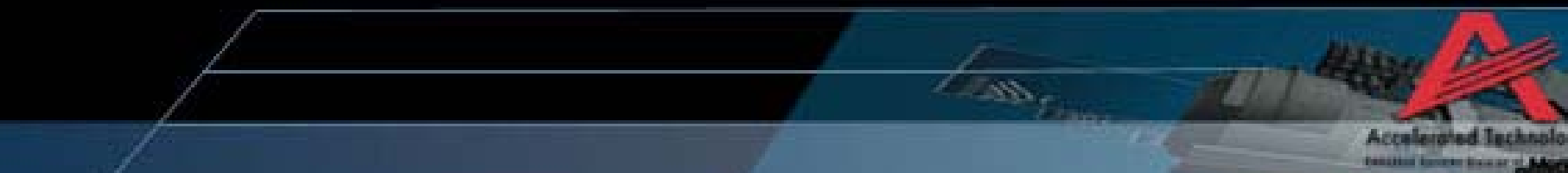
# Nucleus C++

- Object-oriented interface for Nucleus PLUS
- Object-oriented approach to programming
- Objects can be statically or dynamically declared
- Service calls are handled as member functions
- Easy alternative to memory-sharing methods
- Full support for new and delete operators
- Available for any C++ compiler



# Embedded Software Development Tools

A Complete Suite of Tools to  
Support the Nucleus RTOS



# code

# lab

## Embedded Developer Suite

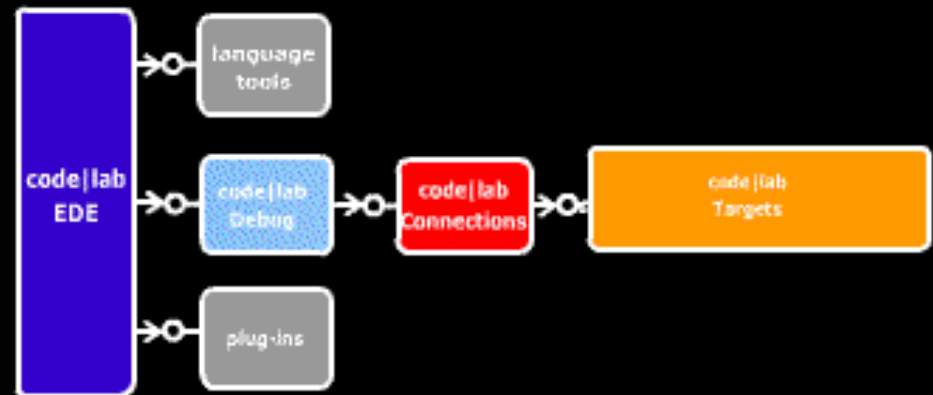
**code|lab EDE**

**code|lab Debug**

**code|lab Connections**

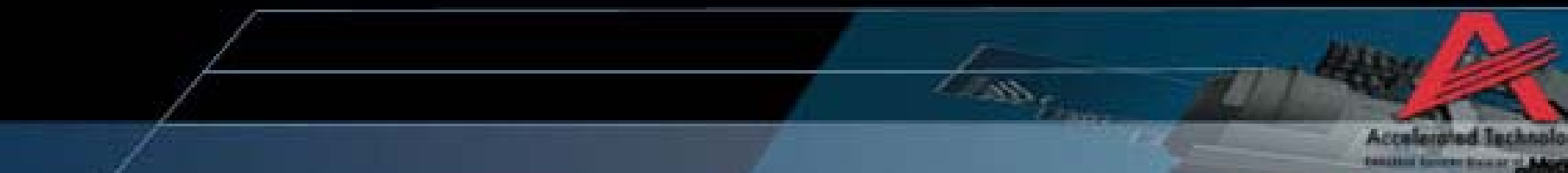
**code|lab Targets**

- Complete Development Environment
- Consistent Interface
- RTOS Independent



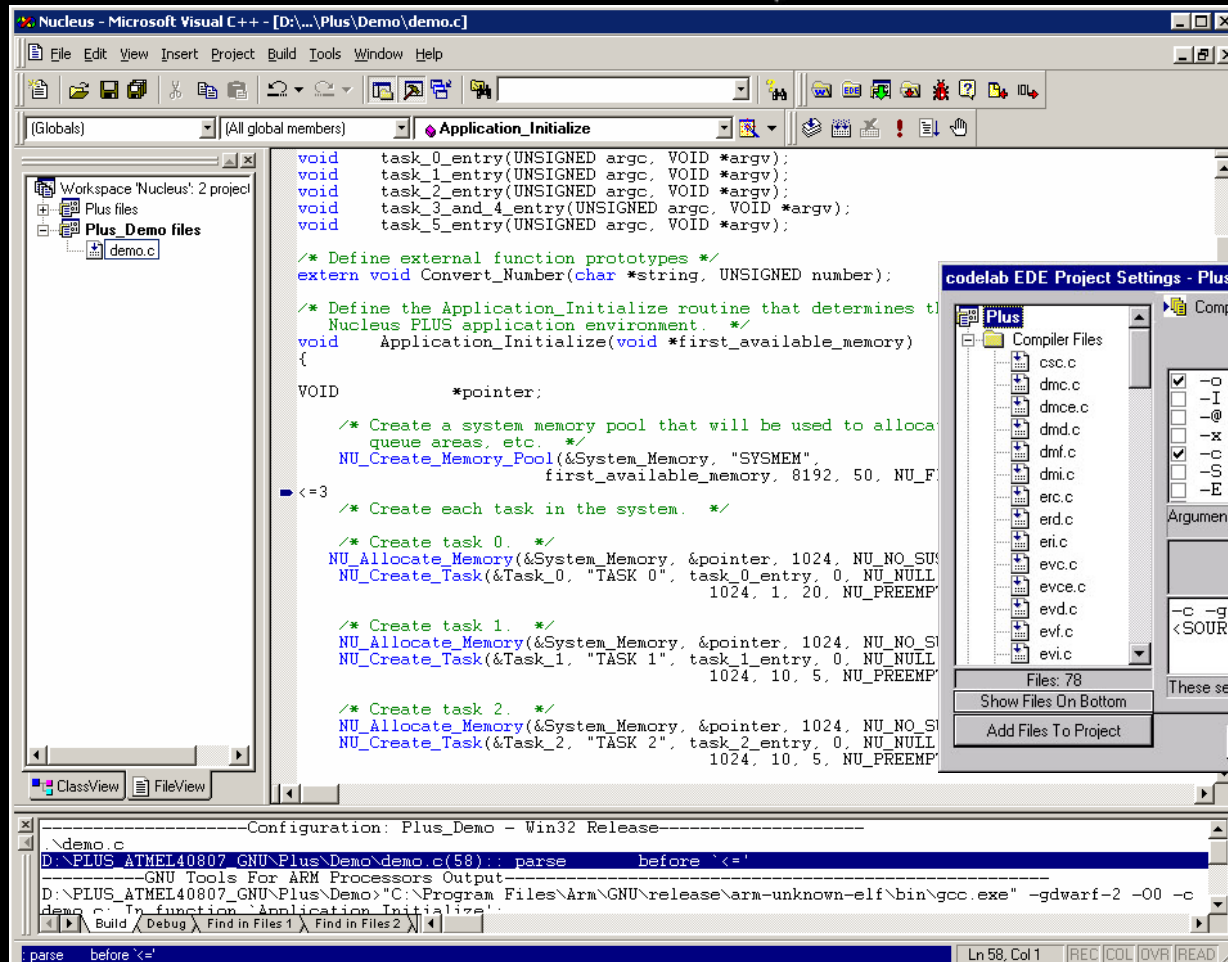
# code | lab EDE

- An IDE based on Microsoft Visual Studio
- Desktop look and feel
- Project Management Dialog Box
- Includes a wide variety of compilers



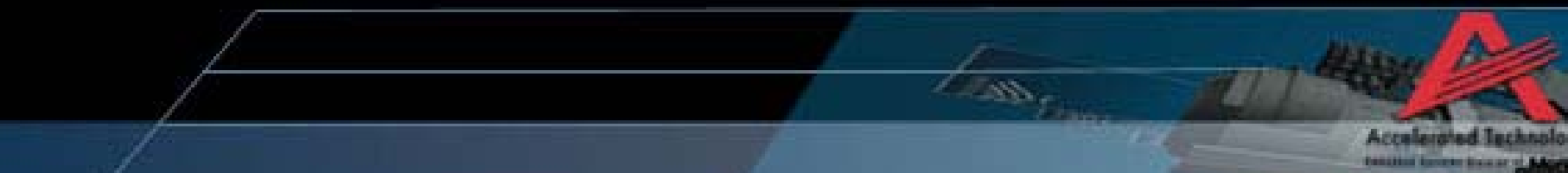


# code lab EDE



# code | lab Debug

- Includes an extended set of tools for discovering problems with your code quickly and easily
- Uses many standard Windows™ capabilities
- Hardware assisted debugging available



# code lab Debug

code lab Debug - (Build: 101701) - [D:\sh4gnu\Plus\_LittleVcc.c]

File View Search Debug Target Memory Windows Help

Workspace

- Application\_Initialize
- CSC\_Place\_On\_List
- CSC\_Priority\_Place\_On
- CSC\_Remove\_From\_List
- DEMO\_Ultoa
- DMC\_Allocate\_Memory
- DMC\_Cleanup
- DMC\_Create\_Memory\_Pool
- DMC\_Deallocate\_Memory
- DMC\_Delete\_Memory\_Pool
- DMCE\_Allocate\_Memory
- DMCE\_Create\_Memory\_Poo
- DMCE\_Deallocate\_Memory
- DMCE\_Delete\_Memory\_Poo
- DMI\_Initialize
- ERC\_System\_Error
- ERI\_Initialize
- EVC\_Cleanup
- EVC\_Create\_Event\_Group
- EVC\_Delete\_Event\_Group
- EVC\_Retrieve\_Events
- EVC\_Set\_Events
- EVC\_Create\_Event\_Group

```
task -> tc_ready_next =    NU_NULL;
task -> tc_ready_previous = NU_NULL;

}

/* Determine if this task the highest priority task. */
if (task == TCD_Execute_Task)
{
    /* Determine the next task to execute. */
    if (TCD_Highest_Priority < TC_PRIORITIES)
    {
        /* Put the next task to execute in TCD_Execute_Task
        TCT_Set_Execute_Task(TCD_Priority_List[TCD_Highest_Priority]);
    }
    else
    {
        /* No other task is ready for execution. */
        TCT_Set_Execute_Task(NU_NULL);
    }

    /* See if the suspending task is the current thread. (Suspend)
    if (task == (TC_TCB *) TCD_Current_Thread)
    {
        /* Leave the task, transfer control to the system.
        TCT_Control_To_System();
    }
    else
    {
        /* Check for a pure suspension request. If present, the
        suspension flag is set. */
        if (suspend_type == NUI_PIURE_SUSPEND)
        {
            /* Set the suspension flag.
            TCT_Set_Suspension_Flag();
        }
    }
}
```

Registers

R...	Value
R0	0
R1	0
R2	0
R3	0
R4	201371764 (Tc
R5	7
R6	201394012
R7	10
R8	201344672 (QU
R9	0
R10	0
R11	0
R12	0
R13	0
R14	201386104
R15...	201386104
SR	1073741825
PC	201339960 (ta
PR	201339958 (ta
GBR	0
VBR	201326592
MACH	0

Registers Flags

Variables

Name	Type	Value
task_ptr	TC_TCB_STRUCT*	201370828
suspend_type	unsigned char	7 'I'
cleanup	function*	201364288 ..
information	void*	201394056
timeout	unsigned int	4294967295
task	TC_TCB_STRUCT*	201370828
index	int	1
temp	unsigned char	4 'I'

Locals

Current Task

```
task_1(unsigned int, voi
TCC_Task_Shell())
```

Memory

Address	Value
00000000	00 00 00 00 00 00 00 00
00000004	00 00 00 00 00 00 00 00
00000008	00 00 00 00 00 00 00 00
0000000C	00 00 00 00 00 00 00 00
00000010	00 00 00 00 00 00 00 00
00000014	00 00 00 00 00 00 00 00
00000018	00 00 00 00 00 00 00 00
0000001C	00 00 00 00 00 00 00 00
00000020	00 00 00 00 00 00 00 00
00000024	00 00 00 00 00 00 00 00
00000028	00 00 00 00 00 00 00 00
0000002C	00 00 00 00 00 00 00 00
00000030	00 00 00 00 00 00 00 00
00000034	00 00 00 00 00 00 00 00
00000038	00 00 00 00 00 00 00 00
0000003C	00 00 00 00 00 00 00 00
00000040	00 00 00 00 00 00 00 00
00000044	00 00 00 00 00 00 00 00
00000048	00 00 00 00 00 00 00 00
0000004C	00 00 00 00 00 00 00 00
00000050	00 00 00 00 00 00 00 00
00000054	00 00 00 00 00 00 00 00
00000058	00 00 00 00 00 00 00 00
0000005C	00 00 00 00 00 00 00 00
00000060	00 00 00 00 00 00 00 00
00000064	00 00 00 00 00 00 00 00
00000068	00 00 00 00 00 00 00 00
0000006C	00 00 00 00 00 00 00 00
00000070	00 00 00 00 00 00 00 00
00000074	00 00 00 00 00 00 00 00
00000078	00 00 00 00 00 00 00 00
0000007C	00 00 00 00 00 00 00 00
00000080	00 00 00 00 00 00 00 00
00000084	00 00 00 00 00 00 00 00
00000088	00 00 00 00 00 00 00 00
0000008C	00 00 00 00 00 00 00 00
00000090	00 00 00 00 00 00 00 00
00000094	00 00 00 00 00 00 00 00
00000098	00 00 00 00 00 00 00 00
0000009C	00 00 00 00 00 00 00 00
000000A0	00 00 00 00 00 00 00 00
000000A4	00 00 00 00 00 00 00 00
000000A8	00 00 00 00 00 00 00 00
000000AC	00 00 00 00 00 00 00 00
000000B0	00 00 00 00 00 00 00 00
000000B4	00 00 00 00 00 00 00 00
000000B8	00 00 00 00 00 00 00 00
000000BC	00 00 00 00 00 00 00 00
000000C0	00 00 00 00 00 00 00 00
000000C4	00 00 00 00 00 00 00 00
000000C8	00 00 00 00 00 00 00 00
000000CC	00 00 00 00 00 00 00 00
000000D0	00 00 00 00 00 00 00 00
000000D4	00 00 00 00 00 00 00 00
000000D8	00 00 00 00 00 00 00 00
000000DC	00 00 00 00 00 00 00 00
000000E0	00 00 00 00 00 00 00 00
000000E4	00 00 00 00 00 00 00 00
000000E8	00 00 00 00 00 00 00 00
000000EC	00 00 00 00 00 00 00 00
000000F0	00 00 00 00 00 00 00 00
000000F4	00 00 00 00 00 00 00 00
000000F8	00 00 00 00 00 00 00 00
000000FC	00 00 00 00 00 00 00 00
00000100	00 00 00 00 00 00 00 00
00000104	00 00 00 00 00 00 00 00
00000108	00 00 00 00 00 00 00 00
0000010C	00 00 00 00 00 00 00 00
00000110	00 00 00 00 00 00 00 00
00000114	00 00 00 00 00 00 00 00
00000118	00 00 00 00 00 00 00 00
0000011C	00 00 00 00 00 00 00 00
00000120	00 00 00 00 00 00 00 00
00000124	00 00 00 00 00 00 00 00
00000128	00 00 00 00 00 00 00 00
0000012C	00 00 00 00 00 00 00 00
00000130	00 00 00 00 00 00 00 00
00000134	00 00 00 00 00 00 00 00
00000138	00 00 00 00 00 00 00 00
0000013C	00 00 00 00 00 00 00 00
00000140	00 00 00 00 00 00 00 00
00000144	00 00 00 00 00 00 00 00
00000148	00 00 00 00 00 00 00 00
0000014C	00 00 00 00 00 00 00 00
00000150	00 00 00 00 00 00 00 00
00000154	00 00 00 00 00 00 00 00
00000158	00 00 00 00 00 00 00 00
0000015C	00 00 00 00 00 00 00 00
00000160	00 00 00 00 00 00 00 00
00000164	00 00 00 00 00 00 00 00
00000168	00 00 00 00 00 00 00 00
0000016C	00 00 00 00 00 00 00 00
00000170	00 00 00 00 00 00 00 00
00000174	00 00 00 00 00 00 00 00
00000178	00 00 00 00 00 00 00 00
0000017C	00 00 00 00 00 00 00 00
00000180	00 00 00 00 00 00 00 00
00000184	00 00 00 00 00 00 00 00
00000188	00 00 00 00 00 00 00 00
0000018C	00 00 00 00 00 00 00 00
00000190	00 00 00 00 00 00 00 00
00000194	00 00 00 00 00 00 00 00
00000198	00 00 00 00 00 00 00 00
0000019C	00 00 00 00 00 00 00 00
000001A0	00 00 00 00 00 00 00 00
000001A4	00 00 00 00 00 00 00 00
000001A8	00 00 00 00 00 00 00 00
000001AC	00 00 00 00 00 00 00 00
000001B0	00 00 00 00 00 00 00 00
000001B4	00 00 00 00 00 00 00 00
000001B8	00 00 00 00 00 00 00 00
000001BC	00 00 00 00 00 00 00 00
000001C0	00 00 00 00 00 00 00 00
000001C4	00 00 00 00 00 00 00 00
000001C8	00 00 00 00 00 00 00 00
000001CC	00 00 00 00 00 00 00 00
000001D0	00 00 00 00 00 00 00 00
000001D4	00 00 00 00 00 00 00 00
000001D8	00 00 00 00 00 00 00 00
000001DC	00 00 00 00 00 00 00 00
000001E0	00 00 00 00 00 00 00 00
000001E4	00 00 00 00 00 00 00 00
000001E8	00 00 00 00 00 00 00 00
000001EC	00 00 00 00 00 00 00 00
000001F0	00 00 00 00 00 00 00 00
000001F4	00 00 00 00 00 00 00 00
000001F8	00 00 00 00 00 00 00 00
000001FC	00 00 00 00 00 00 00 00
00000200	00 00 00 00 00 00 00 00
00000204	00 00 00 00 00 00 00 00
00000208	00 00 00 00 00 00 00 00
0000020C	00 00 00 00 00 00 00 00
00000210	00 00 00 00 00 00 00 00
00000214	00 00 00 00 00 00 00 00
00000218	00 00 00 00 00 00 00 00
0000021C	00 00 00 00 00 00 00 00
00000220	00 00 00 00 00 00 00 00
00000224	00 00 00 00 00 00 00 00
00000228	00 00 00 00 00 00 00 00
0000022C	00 00 00 00 00 00 00 00
00000230	00 00 00 00 00 00 00 00
00000234	00 00 00 00 00 00 00 00
00000238	00 00 00 00 00 00 00 00
0000023C	00 00 00 00 00 00 00 00
00000240	00 00 00 00 00 00 00 00
00000244	00 00 00 00 00 00 00 00
00000248	00 00 00 00 00 00 00 00
0000024C	00 00 00 00 00 00 00 00
00000250	00 00 00 00 00 00 00 00
00000254	00 00 00 00 00 00 00 00
00000258	00 00 00 00 00 00 00 00
0000025C	00 00 00 00 00 00 00 00
00000260	00 00 00 00 00 00 00 00
00000264	00 00 00 00 00 00 00 00
00000268	00 00 00 00 00 00 00 00
0000026C	00 00 00 00 00 00 00 00
00000270	00 00 00 00 00 00 00 00
00000274	00 00 00 00 00 00 00 00
00000278	00 00 00 00 00 00 00 00
0000027C	00 00 00 00 00 00 00 00
00000280	00 00 00 00 00 00 00 00
00000284	00 00 00 00 00 00 00 00
00000288	00 00 00 00 00 00 00 00
0000028C	00 00 00 00 00 00 00 00
00000290	00 00 00 00 00 00 00 00
00000294	00 00 00 00 00 00 00 00
00000298	00 00 00 00 00 00 00 00
0000029C	00 00 00 00 00 00 00 00
000002A0	00 00 00 00 00 00 00 00
000002A4	00 00 00 00 00 00 00 00
000002A8	00 00 00 00 00 00 00 00
000002AC	00 00 00 00 00 00 00 00
000002B0	00 00 00 00 00 00 00 00
000002B4	00 00 00 00 00 00 00 00
000002B8	00 00 00 00 00 00 00 00
000002BC	00 00 00 00 00 00 00 00
000002C0	00 00 00 00 00 00 00 00
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000002C8	00 00 00 00 00 00 00 00
000002CC	00 00 00 00 00 00 00 00
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0000032C	00 00 00 00 00 00 00 00
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00000388	00 00 00 00 00 00 00 00
0000038C	00 00 00 00 00 00 00 00
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0000039C	00 00 00 00 00 00 00 00
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000003B4	00 00 00 00 00 00 00 00
000003B8	00 00 00 00 00 00 00 00
000003BC	00 00 00 00 00 00 00 00
000003C0	00 00 00 00 00 00 00 00
000003C4	00 00 00 00 00 00 00 00
000003C8	00 00 00 00 00 00 00 00
0	

# code | lab Connections

Communication from your debugger to your target hardware

- Emulators
- On Chip Debugging
- JTAG, Nwire, and H-UDI
- Serial Connection
- Ethernet Connection



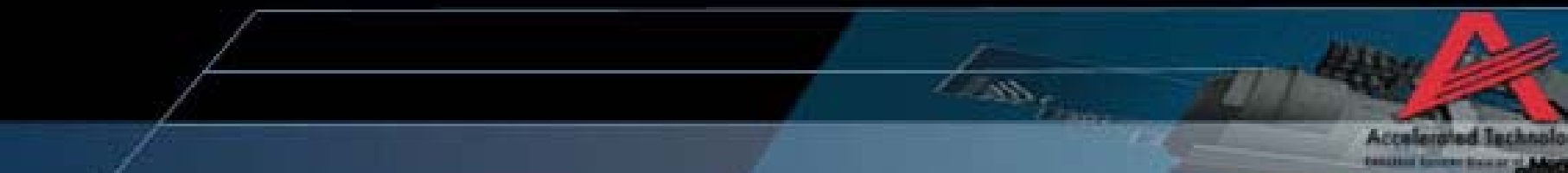
# code | lab Targets

## Hardware Boards and Architectural Simulators

**Software Emulation** - Monitor the execution of your code. Develop Assembly code and test it before your target is available.

**Accelerated Technology Hardware** - Hit the ground running with a range of target hardware and a number of specific CPUs supported.

**Commercial Hardware** - We have a number of commercial boards that we support. We also provide application notes to solve the problem of connecting the board to the debugger and getting the RTOS, or your own software, running on the boards.



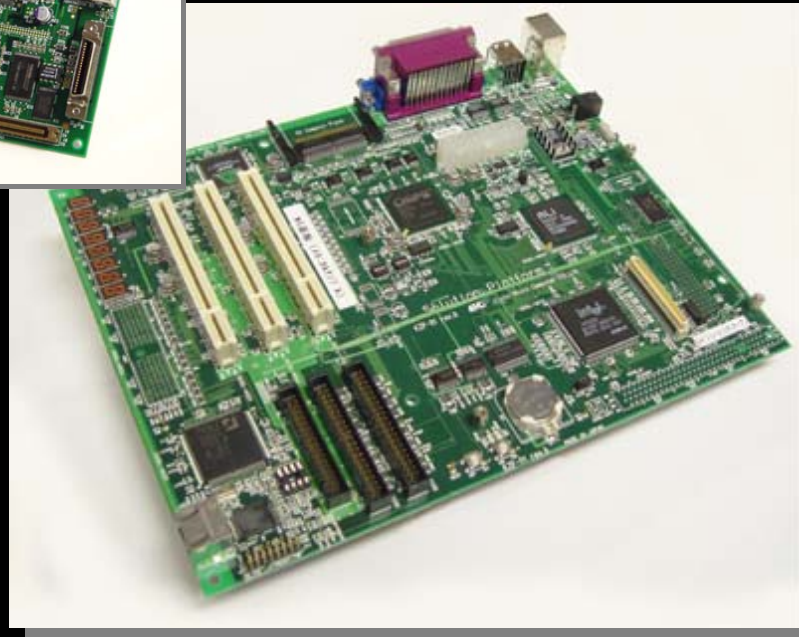
# code

# lab Targets

QuickStart Kit



SH4 Daughter Card



Kmc Solution Platform

# code|lab Processor Support

## Supported:

**code|lab Partner-J** (SH,  
ARM, MIPS)

**code|lab Monitor** (ARM,  
MIPS, NIOS, V85x,  
XScale)

**BDI** (ARM)

**Wiggler** (ARM)

**Raven** (ARM)

**Angel** (ARM)

**RDI** (ARM)

**MultiICE** (ARM)

**NEC-BOX** (MIPS)

**UMON** (ARM, SH)

**JEENI** (ARM)

**FS2**(MIPS)

## In-the-works:

**ET 10A** (H8/S)

**ByteBlaster** (ARM)

**EmbeddedICE** (ARM)

## Planned:

**Computex OCD** (ARM)

**MPdemon** (ARM, Xscale,  
MIPS, V85x)

**ETM** (ARM)

**CodeTEST** (ARM, MIPS)

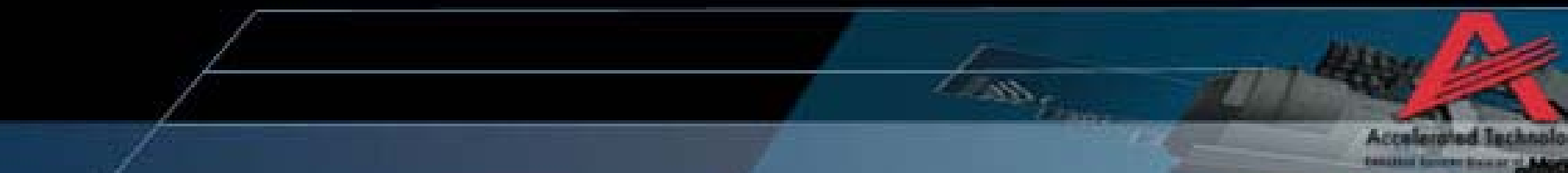




# XRAY Debugger

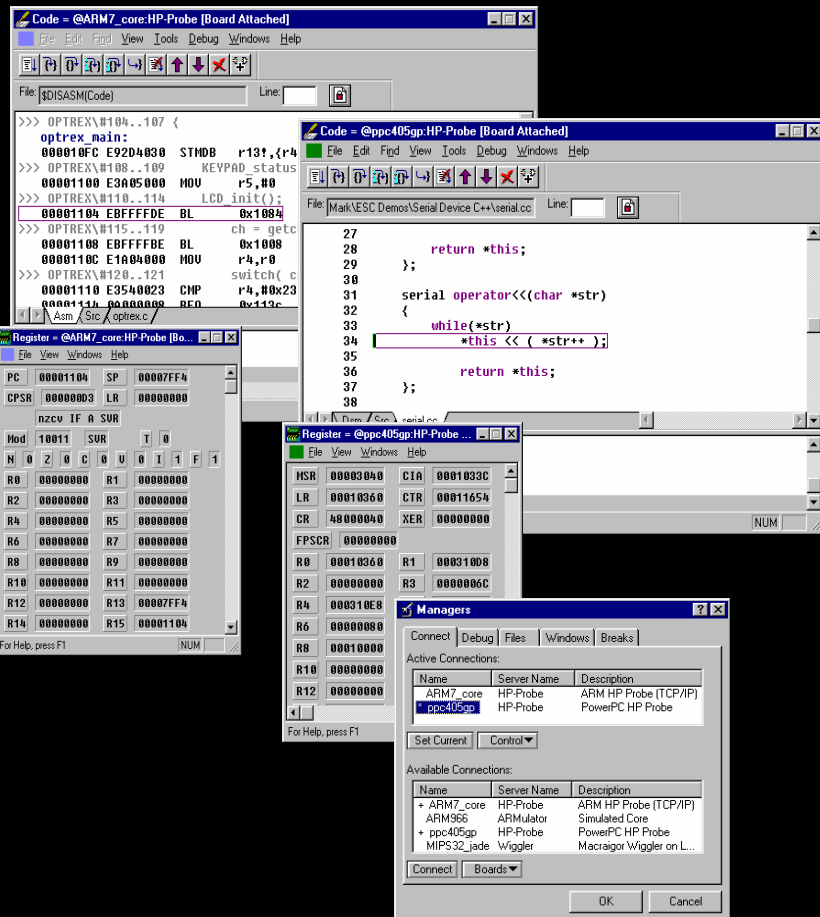
Mentor Graphics XRAY® Debugger is the key to success for all software developers using modern processors and cores in embedded and System-on-Chip (SoC) applications. XRAY brings all the benefits of an industry-standard debugger to engineers working in visibility- and resource-constrained environments.

- Powerful debugging capabilities
- State-of-the art development environment
- Powerful project management
- Industry-leading multi-core debug technology
- Heterogeneous and homogeneous target environments





# XIRAY Multi-Core Debugging



- One debugger
- One debug port
- Multiple targets
- Code, register and memory windows per processor or core
- Color coding per processor and core for quick identification
- Synchronous breakpoints across processors and cores
- Simulation, JTAG, Co-verification and monitor connections
- Homogenous and heterogeneous environments



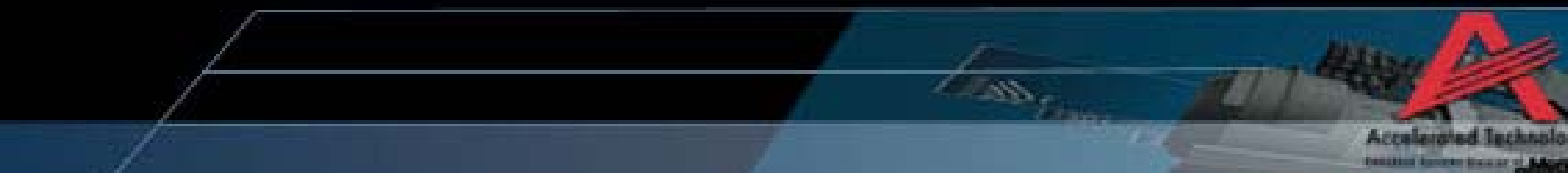
# Processor Support

- Motorola 68xxx and Motorola CPU32
- Motorola/IBM PowerPC
- Motorola ColdFire
- ARM
- MIPS

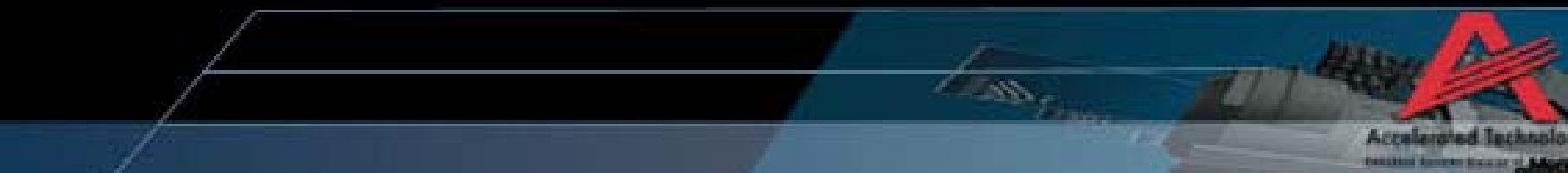


# Microtec Cross Compilers

- Advanced C++ optimizations dramatically reduce application memory usage
- Pre-compiled header files slash compile times
- Flexible code and data segmentation enables easy ROMing of applications
- C language extensions minimize the need for assembly language
- Compliance with ANSI C/C++ standards

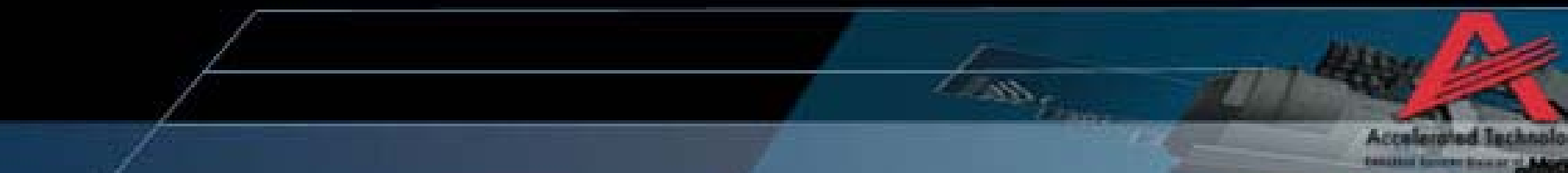


# **Nucleus & code|lab Solution for ALTERA Excalibur**



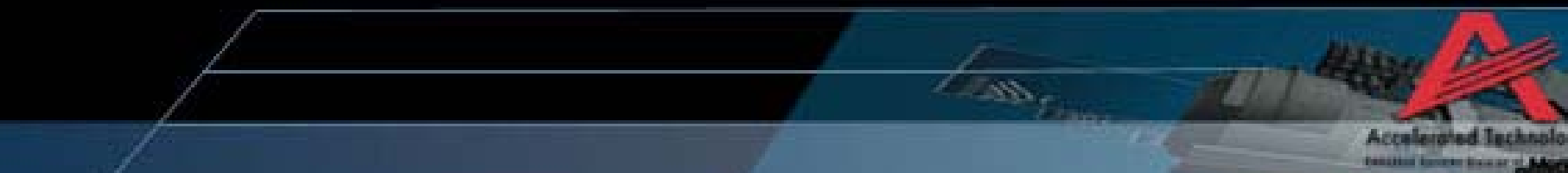
# Nucleus and code|lab for ALTERA Excalibur NIOS1, 2

- Nucleus Software
  - Nucleus PLUS for ALTERA NIOS.
- Development Environment.
  - IDE : code|lab EDE
  - Compiler : Cygnus GNUPro Tools.
  - Debugger : code|lab Debug
  - Connection : code|lab Monitor(S/W)
  - Hardware : NIOS Board APEX EP20K200EFC484



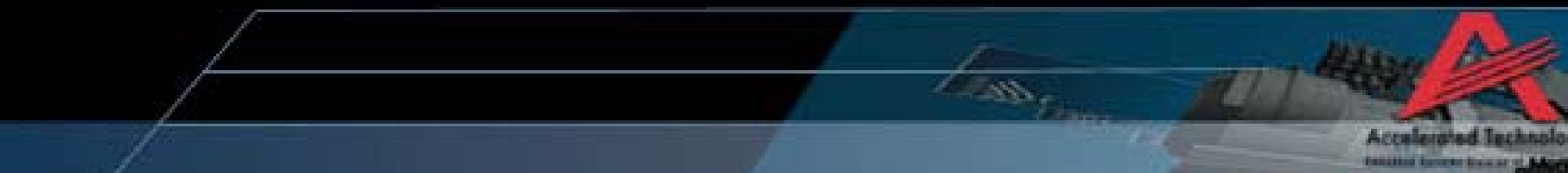
# Nucleus and code|lab for ALTERA Excalibur ARM922T

- Nucleus Software
  - Nucleus PLUS for ALTERA ARM922T.
- Development Environment.
  - IDE : code|lab EDE
  - Compiler : ARM ADS Tools.
  - Debugger : code|lab Debug
  - Connection : ByteBlaster MV(H/W)
  - Hardware : Excalibur XA10 Development Board



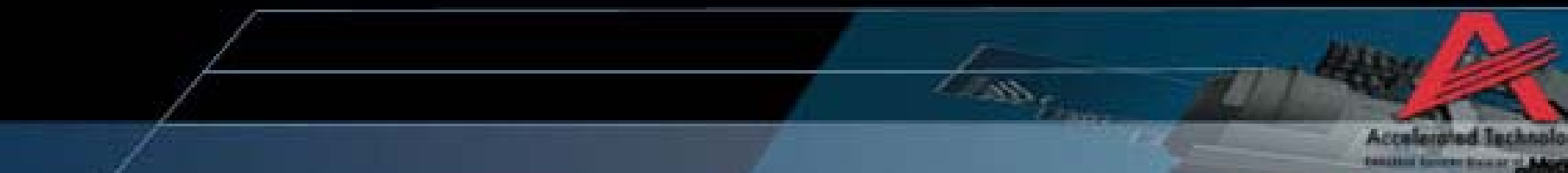
# Technology Roadmap

A One Year Outlook  
for Development Tools and RTOS



# Product Technology

- Software Development Tools
  - Increase IDE functionality over multiple hosts
    - Windows and Unix
  - Support new processor cores and connection environments
  - Release new revolutionary debug technology
  - Link our products to other software development tools and test environments
  - Continue investment in compiler technology
  - Increase compatibility with other RTOS'





# code|lab Debugger Evolution

## codename="Opus"

- New generation of debug technology
  - Native UI's depending on host
    - MFC on Windows, Java on Unix
  - Distributed debugging
  - CORBA back-plane for efficient and extendable communications
- More portable to new targets/environments
- Increased set of processors and connections
- **All** features of code|lab and XRAY supported
  - Multi-core
  - Multitasking
  - RTOS independent



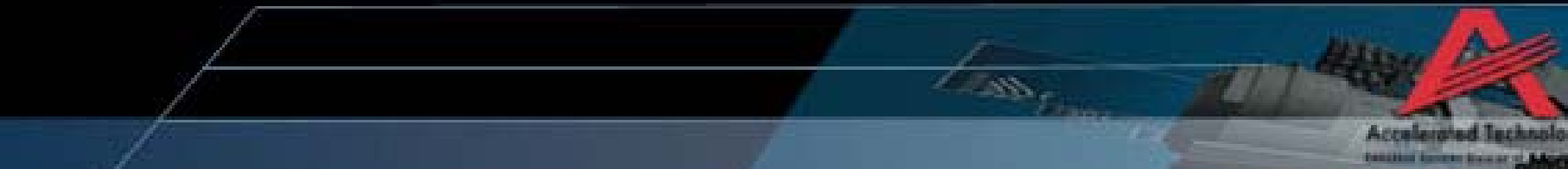
# Product Technology

- RTOS
  - Increased processor and platform support
  - Additional focus on standards: OSEK, POSIX, Certifications
  - Increased middle-ware
    - Protocol stacks (e.g USB, IPv6)
    - JAVA support
    - Enhanced Web, Email, file and Graphics support
  - Nucleus PLUS 2.1



# Service and Training

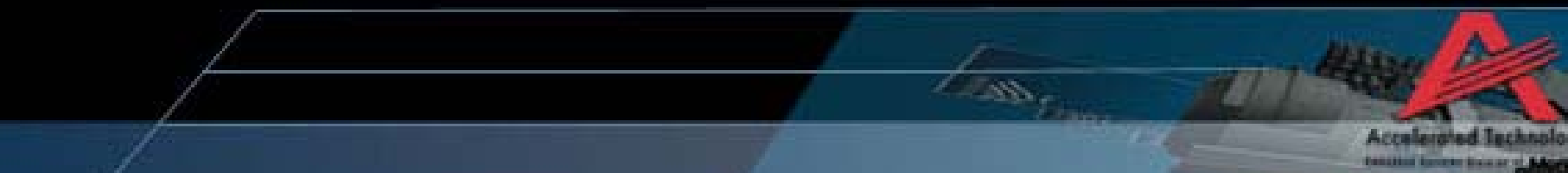
Helping You to Maximize Your  
Efficiency Using Our Products



# Outstanding Customer Service...



- Our technical support is available throughout the entire development process
  - We offer training worldwide at our locations or yours
  - Global Tracking System!  
Another way that Mentor Graphics Customer Support delivers rapid, expert response to customers' technical issues
- Get a guided tour! [www.mentor.com/supportne](http://www.mentor.com/supportne)

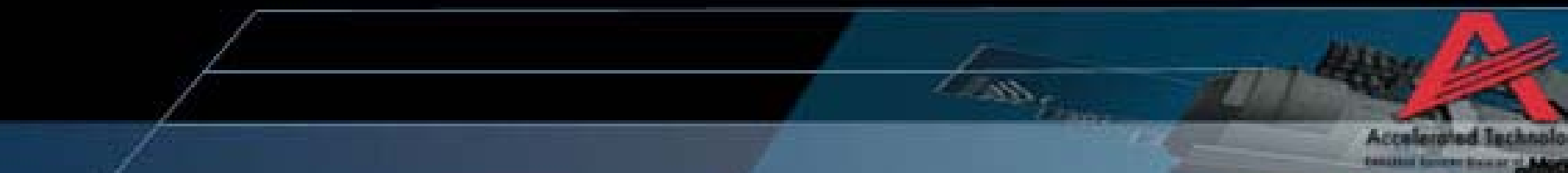


# Outstanding Customer Service...

“No one could ask for better support. Your help, and the manuals, confirm what we heard from many sources while we were shopping for an RTOS: Nucleus support is head-and-shoulders above anyone else's. Maybe even head, shoulders AND torso above anyone else's support.”

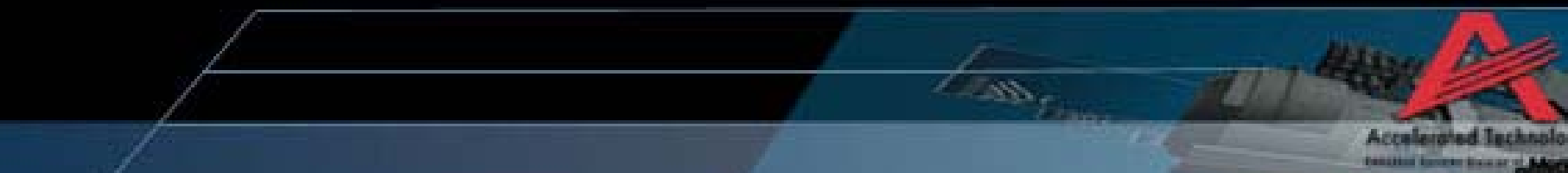
-Rick Corey, *Senior Programmer*

DPC Instrument Systems Division



# Korean Training Course

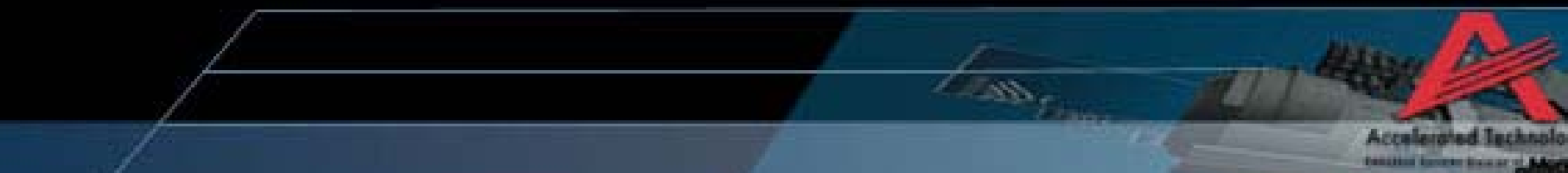
- Nucleus 2 days course
  - Nucleus PLUS only
- Nucleus 3 Days course
  - Nucleus NET, Nucleus GRAFIX with 2 Days course
- Nucleus 5 Days course
  - Including Development Tools(IDE, Compiler, Debugger, etc)
  - Training with Nucleus PLUS training(theory and Exercise)



# Why Accelerated Technology?



- Experience
- The Complete Solution
- Business Model
- Outstanding Customer Service
- Worldwide Presence
- Ability to standardize over different hosts and targets



# Unifying the Desktop and Target



Accelerated Technology, Embedded Systems  
Division of Mentor Graphics



Accelerated Technology  
Embedded Systems Division of **Mentor**



# Thank you for your attention

Accelerated Technology Korea

2002. 11. 6

