# Accelerator Exoskeleton: IA Look-n-Feel for Heterogeneous Cores

## Program heterogeneous cores as easily as SSE

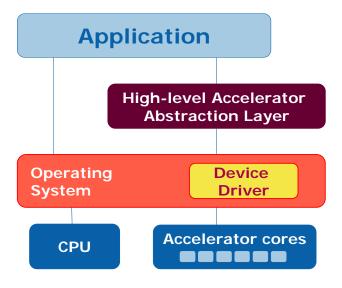
- Shared virtual memory multithreading programming model
- Accelerator code (assembly or domain-specific HLL) inline with high-level C/C++
- Build single fat binary containing both IA and accelerator instructions
- Familiar IA software development tool chains (compiler, runtime, debugger)

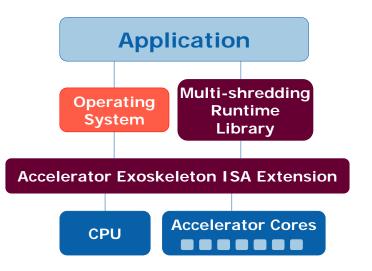
#### Legacy Driver-based SW Ecosystem

- Communication overhead (OS / driver)
- Must map computation to driver / abstraction API

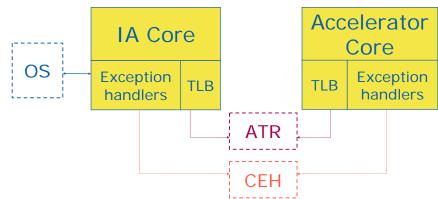
#### **Accelerator Exoskeleton**

- IA ISA Extension for MIMD
- Accelerator cores as MIMD functional units
- User-level multi-shredding





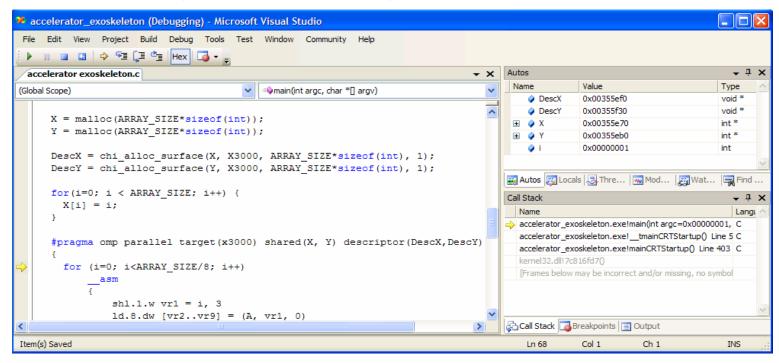
- CEH Handle fault / exception on behalf of accelerator core
- ATR Provide accelerator TLB miss requests in native format





# Accelerator Exoskeleton: IA Look-n-Feel for Heterogeneous Cores

### IA Look-n-Feel IDE (Microsoft Visual Studio) for Application Development



#### IA Look-n-Feel Compilation and Execution

```
C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

C:\accelerator_exoskeleton\linear>compile

Copyright (C) 1985-2006 Intel Corporation. All rights reserved.

linearfilter.c

Begin compiling X3000 assembly

End compiling X3000 assembly

Microsoft (R) Incremental Linker Version 8.00.50727.42

Copyright (C) Microsoft Corporation. All rights reserved.

-out:linearfilter.exe
-nodefaultili:libguidedstats.lib
-nodefaultili:libguidedstats.lib
-defaultlib:libguided stats.lib
-defaultlib:libguided stats.lib
-defaultlib:libguided.lib
ShredLibk.lib
linearfilter.obj

C:\accelerator_exoskeleton\linear>linearfilter.exe ..\input\holly.bmp out.bmp

Linearfilter processed!

C:\accelerator_exoskeleton\linear>________
```



