

Cut the time it takes to develop sensor processing in half



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Oct 2013

1. There is a shifting landscape in defense industry
Requiring to prove before build and sell sensor systems
Risk reduction is key
2. At the same time technology is pushing the limits
of the performance level achievable with generic IT computing technology
of 4th gen. compilers bringing automation in data flow applications design
3. Kontron and Gedae present a nice combination to overcome the new
challenges, as well as the old ones: Time, Money
4. Kontron presents StarVX,
a line of pre qualified HPEC systems and components for field proving
5. Gedae presents Idea
A new generation of compiler for systems
Brings a new agile paradigm for sensor application development

A shifting landscape: Agile procurement comes to MIL

Mil Integrators

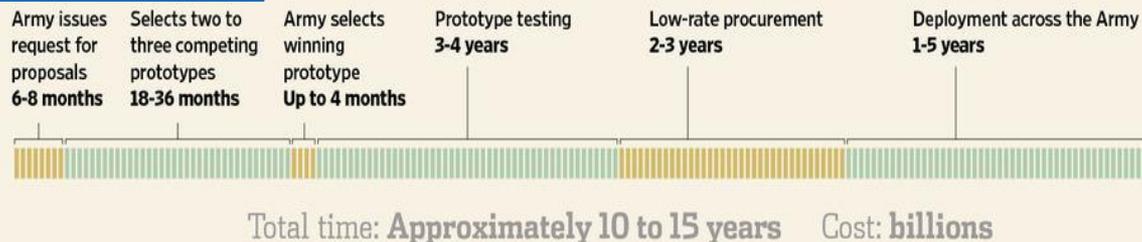
- Risk Reduction Phase
 - Proof Of Concept
 - Deploy DIFFERENT Computers Many years later
 - Must Include techno computing refresh
-
- Acquire Computers for SW engineers & **Win** field te:



Shopping for Gear | The Army's new process for procuring equipment

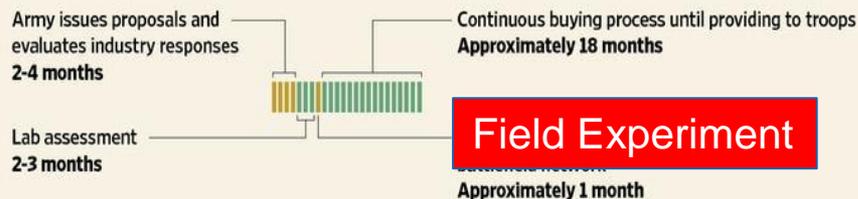
CURRENT

Program of Record (old approach)



NEW

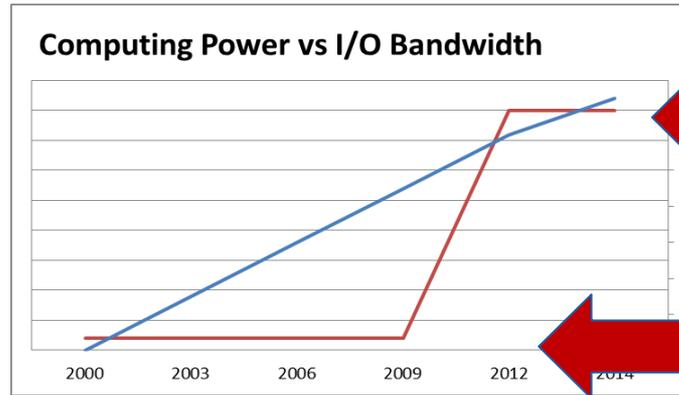
Agile Acquisition (new approach)



Sources: U.S. Army; WSJ research

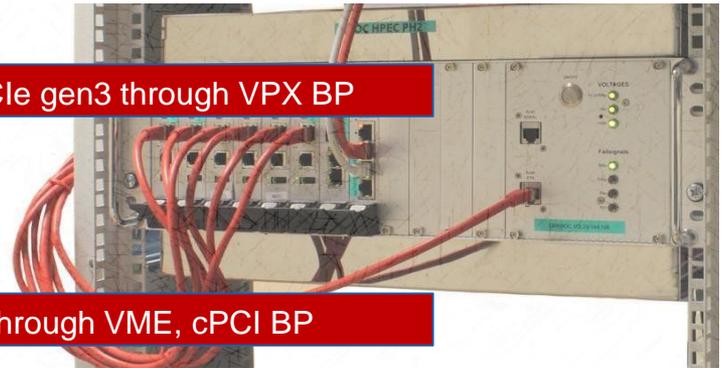
Wall Street Journal Nov 2011

- » Of the performance level reached by generic IT computing technology available in rugged embedded computing

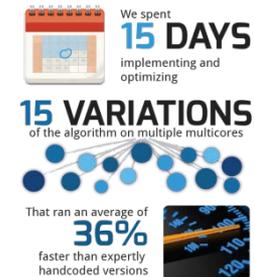


IP on PCIe gen3 through VPX BP

IP on GETH through VME, cPCI BP



- » Of the automation level enabled by 4th gen compilers for parallel sensor application development and deployment



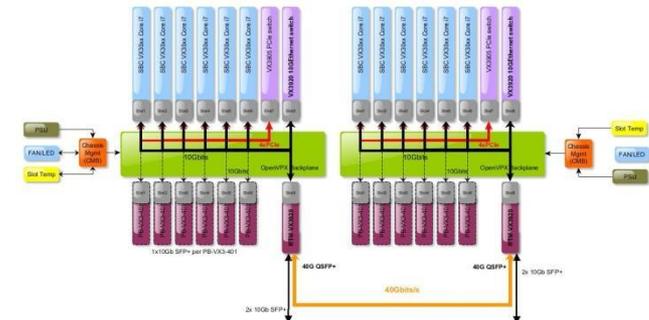
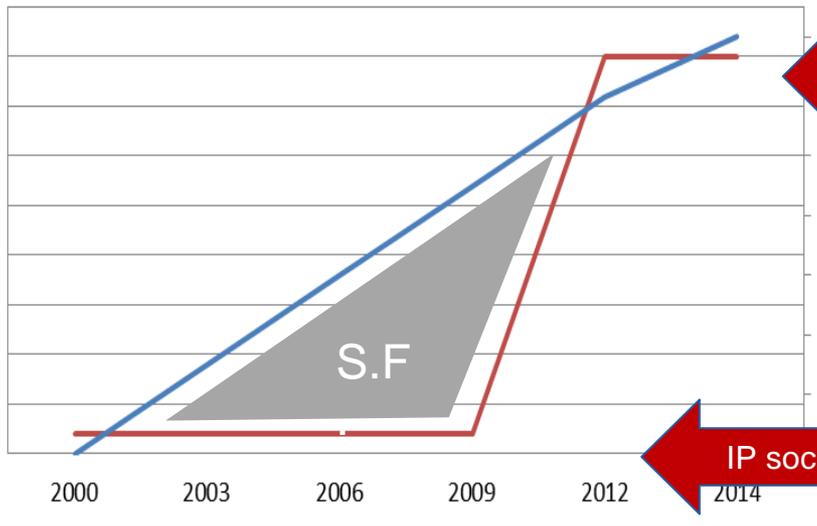
We spent **15 DAYS** implementing and optimizing

15 VARIATIONS of the algorithm on multiple multicores

That ran an average of **36%** faster than expertly hand-coded versions

» Now that the CPU vs I/O ratio is restored, no need for exotic technology

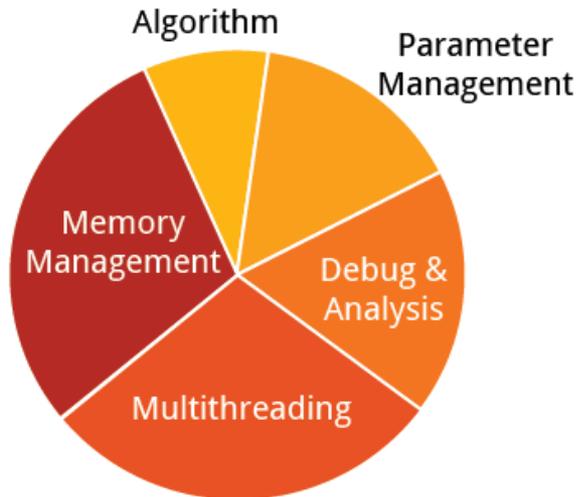
Computing Power vs I/O Bandwidth



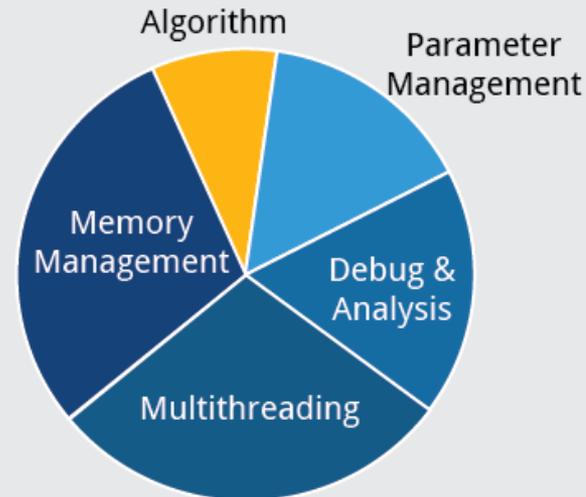
- » Turn-key StarVX Computers are built with Kontron pre qualified elements
- » Run Leading Edge Sensor Applications using only future proof APIs
 - IP Sockets, ETHERNET , PCIe, Linux,

4th gen 'system compiler' adds maximum automation to the development cycle

Application coded by hand using traditional SW Development Platform



Application Created using Gedae Development Platform

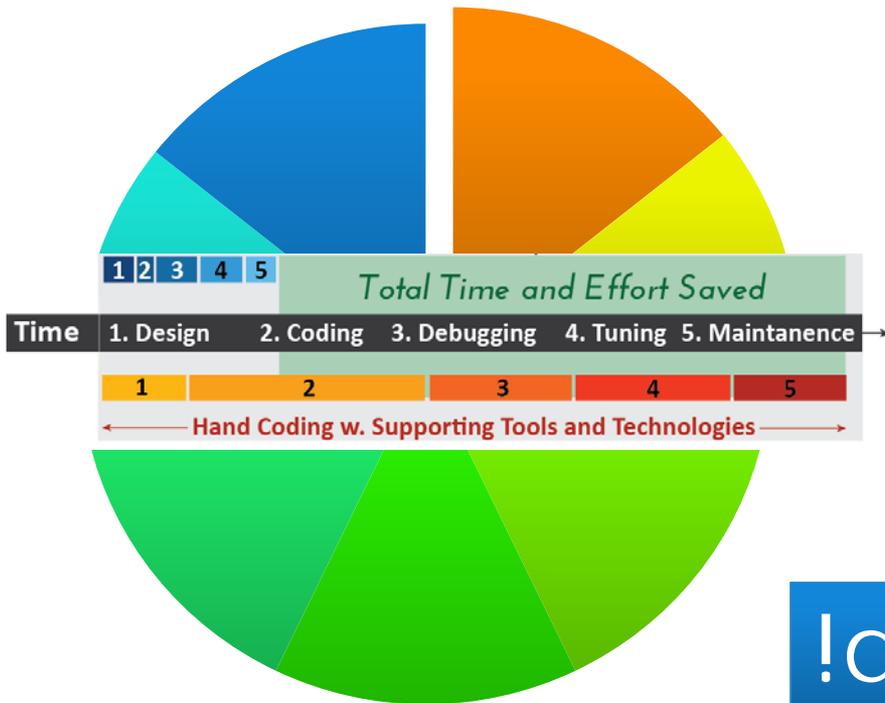


 **Code written by the Software Developer**

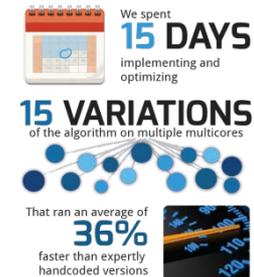
 **Automatically written by the Gedae Compiler**

A unique combination Is changing the rules

StarVX™



!dea©





kontron



Gedae

StarVX

A line of pre qualified HPEC systems and components

Future Proof Architecture for Field Proving & Risk Reduction

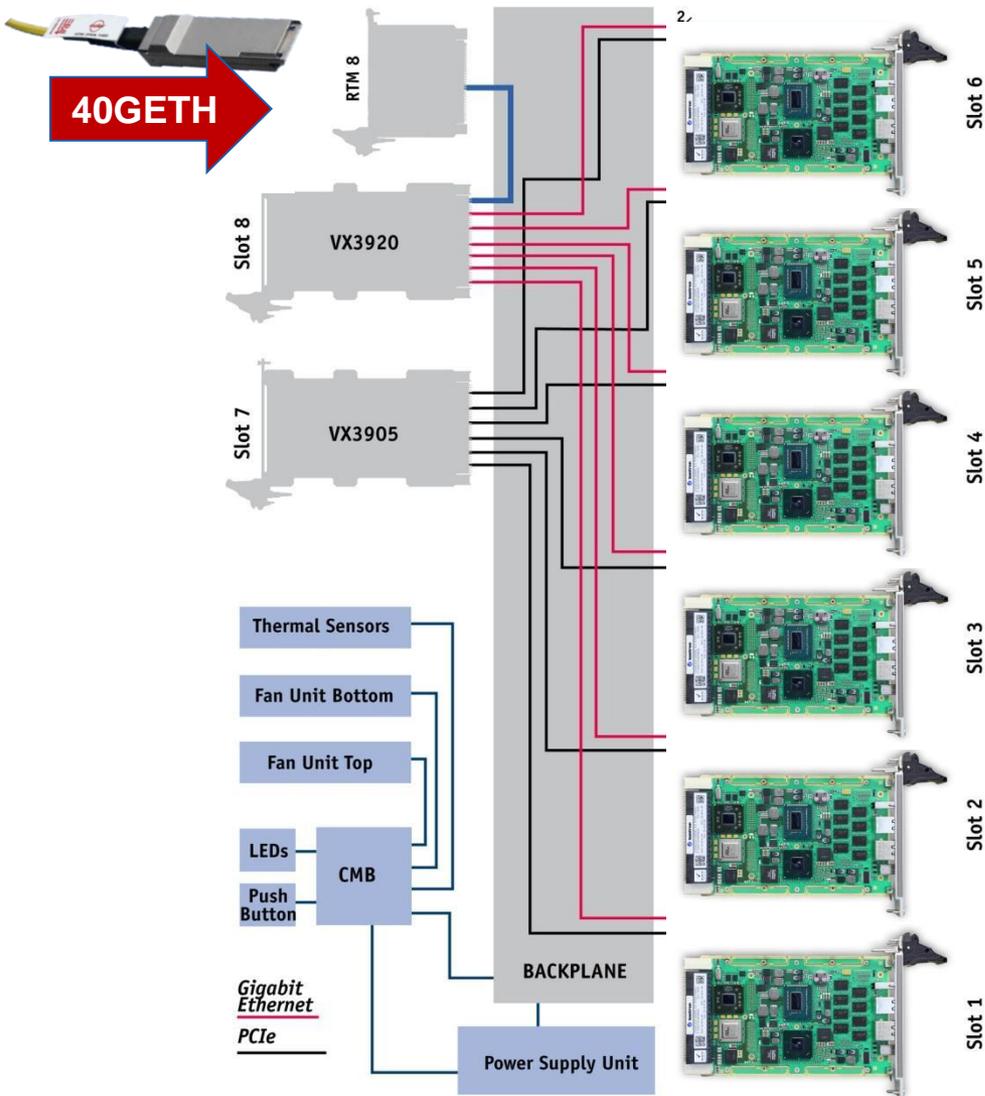
What is it ?

- » What is StarVX ?
 - Computer architecture for HPEC applications
 - VPX boards , backplanes, enclosure, software
- » Payload Boards:
 - Computers (Core i7 1st, 2nd,3rd generation)
 - Switches: PCIe and Ethernet switches
- » Managed Enclosures
 - VXControl™ SNMP, HTTP centralized management
- » What is different with StarVX ?
 - Turn-Key, pre validated computers
 - Available in different skins and sizes



STARVX Built for bandwidth technology

with generic IT



» First Data Plane 10 GETH

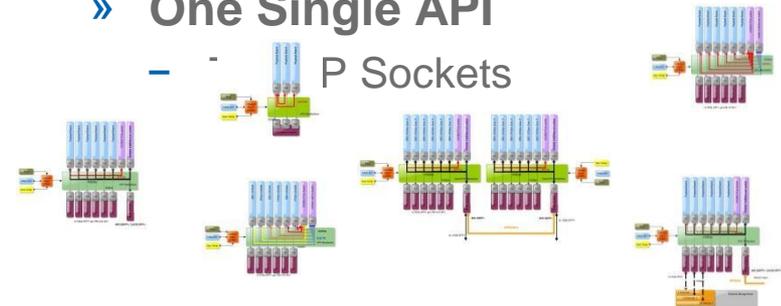
- Single star
- 2 Channels per CPU
- 22 port Switch
- 1.1GB/s BW per port

» Second Data Plane x4 PCIe

- Single Star
- 1 port per CPU
- 24 lane Switch
- 2GB/s BW per CPU

» One Single API

- P Sockets



» Software

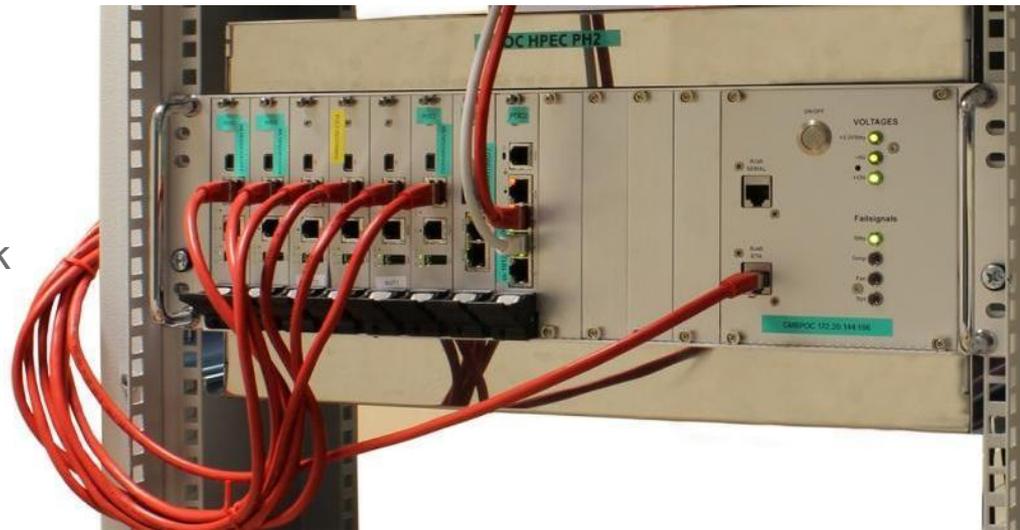
- Gedae System Compiler
- Fedora Linux Distribution with Parallel tasks management
- Diskless nodes support (PXE Boot + Layered FS 'a la Live DVD)
- TCP/IP on PCIe : VXFabric™

» Benchmarking

- Intel IPP Compilers
- CPU and GPU FFT benchmarks
- Stress Test Application Framework (for I/O and CPU load + check)

» Health Management

- Sequenced System PowerUp
- System-wide PBIT
- Temp/Power/Performance management at system Level
- Shelf Manager (instant-on: 0.5s boot time)



- » StarVX restores Ideal CPU to I/O performance ratio
- » StarVX elements allow a large number of computer profiles
- » StarVX API : Linux, TCP/IP, SNMP will survive decades
- » StarVX is Ready to use : turn-key, managed, app-ready,





kontron



Gedae

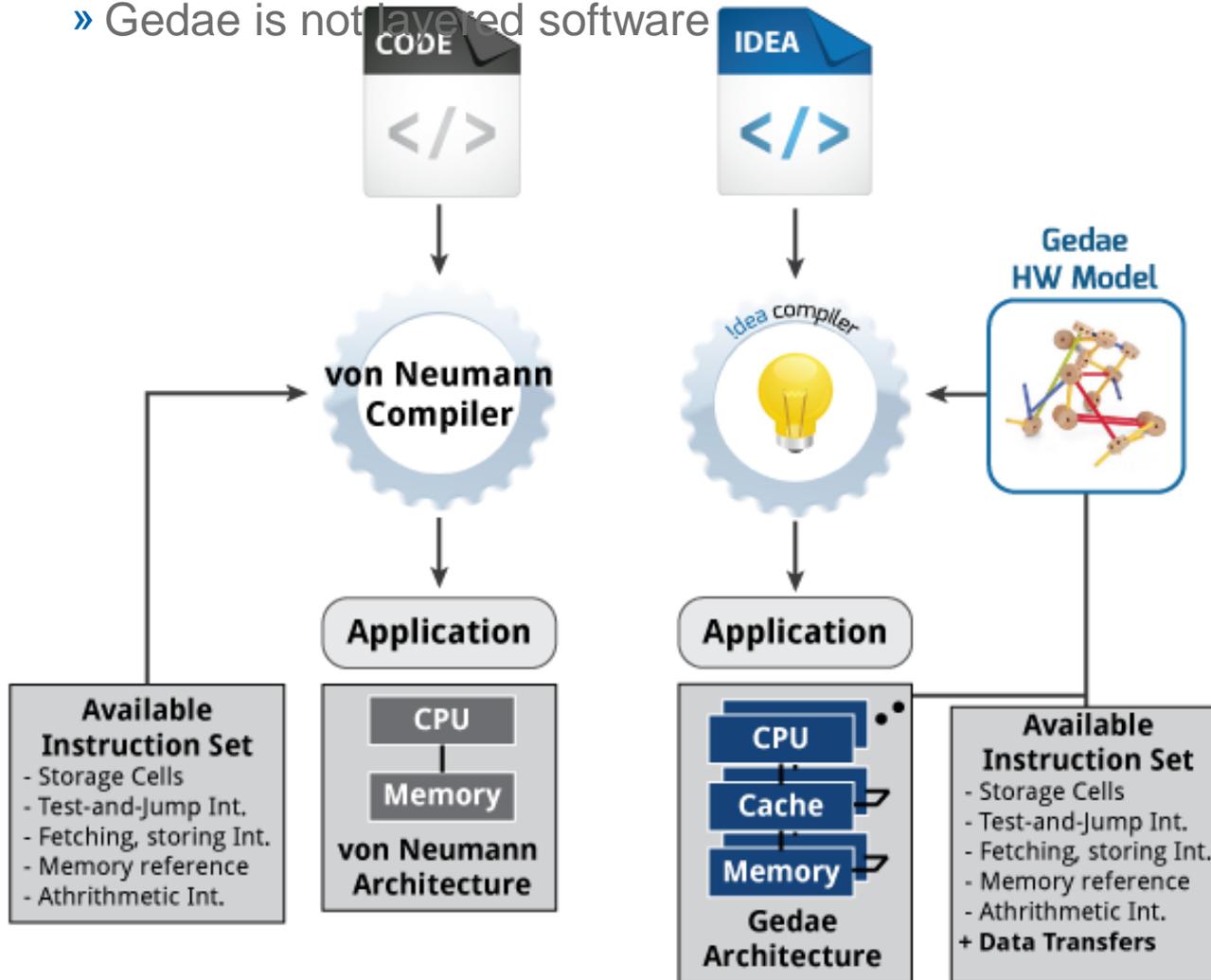
!dea©

A 4th generation compiler:

When compilers target a single chip, !dea targets the whole system !

Gedae extends the von Neuman Programming Model

» Gedae is not layered software



» Each compilation produces custom optimized machine code

Abstract Language



Maintains Separation of Software Components

Application

Implementation Settings

Compiler



Automatically Builds Optimized Software for Chosen HW

Verifies:

- multi-rate processing
- token sizes

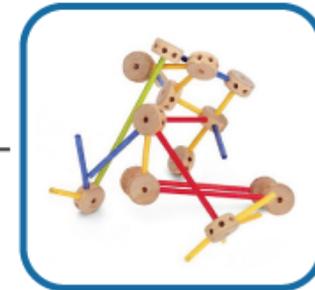
Optimizes:

- data transfers
- memory plan
- concurrency control

Produce Executables:

- best efficiency
- best quality

Gedae HW Model



BSP implements vendor specific instructions



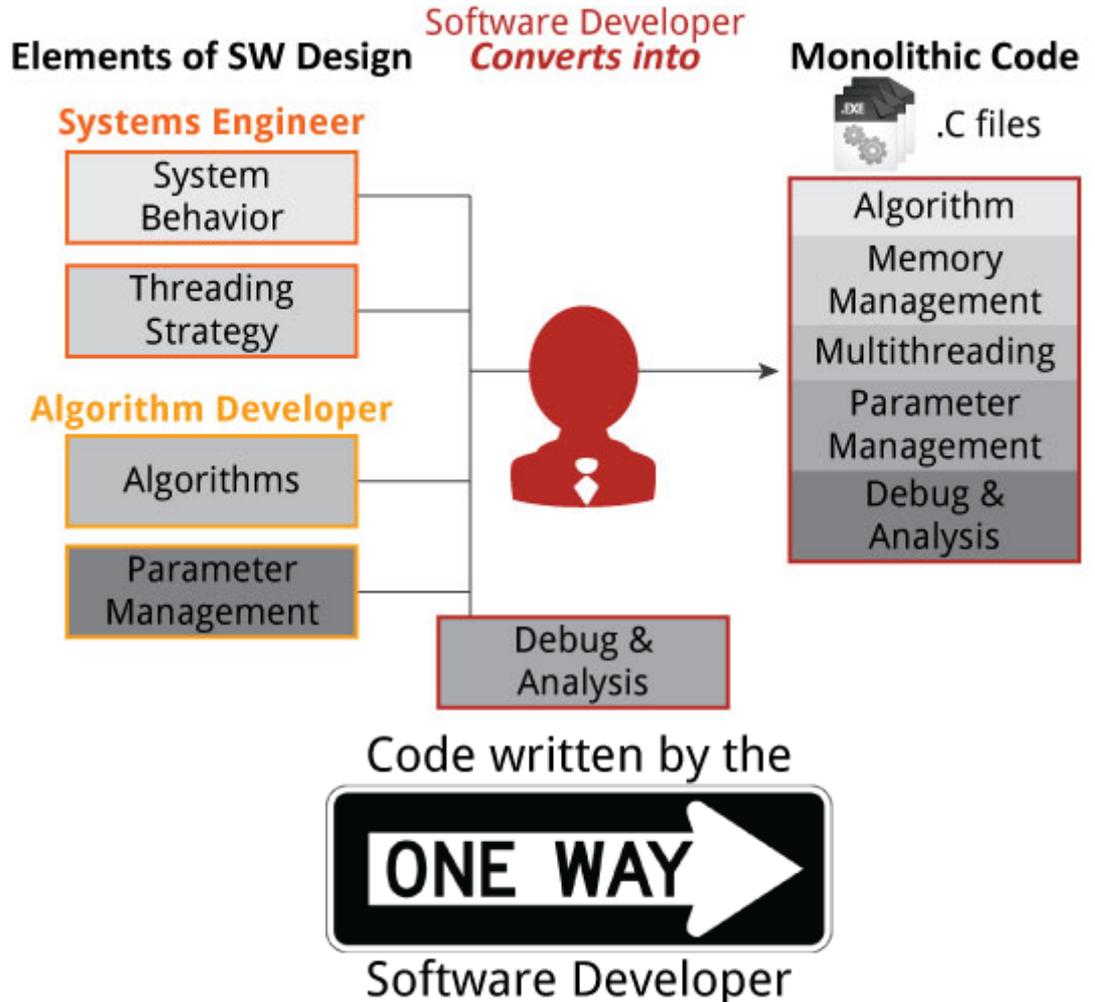
» Software development process *framents* team

» Drives Risk

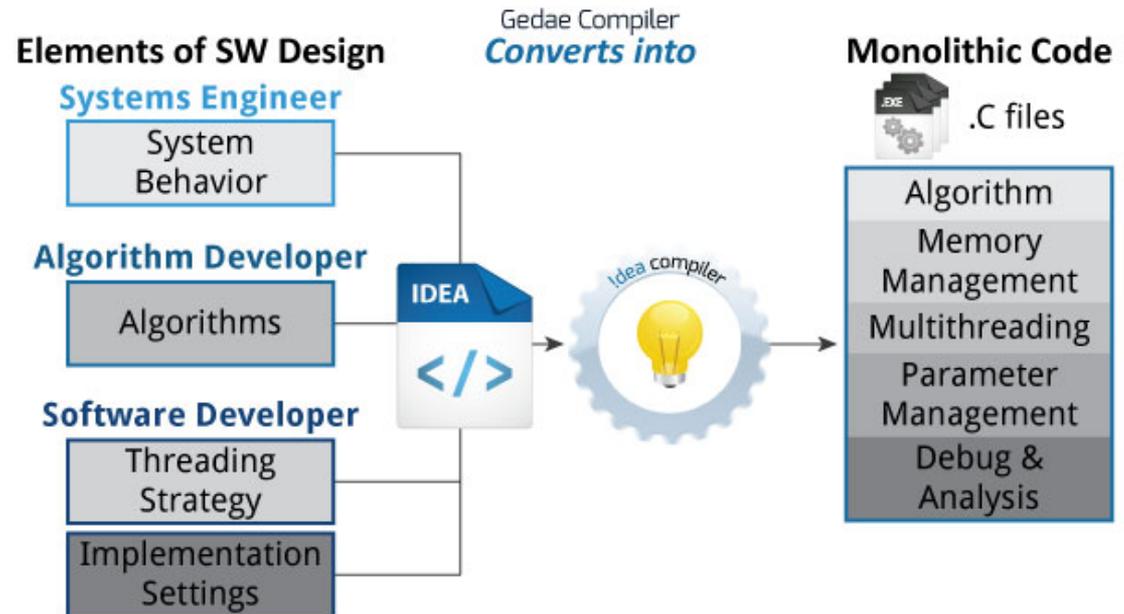
» Algorithmic IP

- Entangled with implem
- Manual maintenance

» Life-cycle maintenance



- » Gedae unifies the soft
- » Rapid development
- » Reuse of algorithmic IF
 - Open systems
 - Jump start production
- » Performance
 - Maximum efficiency
 - HW Utilization
- » Dramatically
 - Shortens schedule
 - Lowers Cost
 - Reduces risk



Automatically written



by the Gedae Compiler

A Complete Software Development Environment

- » Powered by the Idea Language and
- » Automates the development of softw
- » Development Tools:
 - Data Analysis
 - Execution Analysis
 - Testing
 - Debugging



» Proven on 40+ Production Programs



- » Dramatic effect of compound benefits turns software development into an advantage



- » Meet most demanding SWAP-C Requirements
- » Deliver more powerful, fully featured software
- » Build complete systems with IR&D and BD Budgets
 - POC, field demonstrators, production prototypes & production systems
- » Drive refreshes by easily migrating to new, more powerful hardware or adding new application features

Conclusion

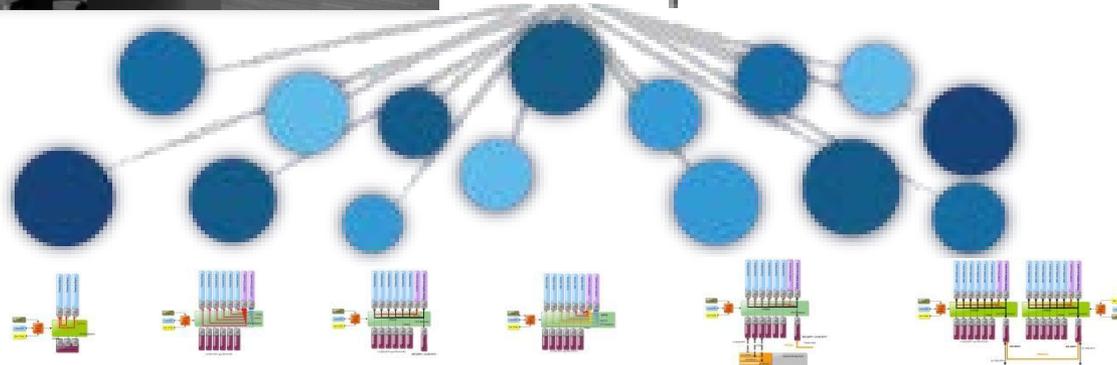
- » !dea is the StarVX system compiler
- » And
- » Because StarVX offers the most generic IT technology architecture
- » Because StarVX allows multiple computer profiles and skins
- » Because StarVX is constantly upgraded with new building blocs
- » Because !dea brings maximum automation in application development
- » Because !dea allows
to develop once
and compile for multiple target architectures

Design. Develop. Deploy ... Done!
StarVX™ and !dea©



Design

An Application



Deploy

A Product Line



Thank You !

Q&A



- » I have seen Gedae associated with other vendor platforms in the past, what is different this time ?
 - With the strategic choice of Kontron of using exclusively future-proof generic IT technology to build StarVX, this allows Idea to leverage a stable system platform to support for many years ahead, just like classic compilers leverage stable silicon architectures to offer better performance.

- » What are the future steps for StarVX ?
 - 2014 will see more computer skins offered around the StarVX building blocs, to address a wider scale of application deployments,
 - Also A new computing boards and more I/O interface styles (both Legacy: sFPDP and next gen).
 - On the architecture front Gedae and Kontron will cooperate to address co processing using FPGA within the Idea framework

Annex

Support slides for Q&A session