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High performance tools to debug, profile, and analyze your applications

What's new in Allinea's tools

From easy batch script integration & remote access to energy profiling

allinea FORGE

allinea DDT

allinea MAP

allinea PERFORMANCE REPORTS

Introduction Agenda

- **Overview of HPC current and future needs**
- **What's new in Allinea's tools**
  - Transitioning from CPU Hours to Power Usage
  - Enabling easy remote application development
- **What is coming next**
  - Reducing trapped capacity on next-gen processors
  - Coming Allinea "good stuff"

HPC Ultimate target

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Example: Weather and Forecasting models

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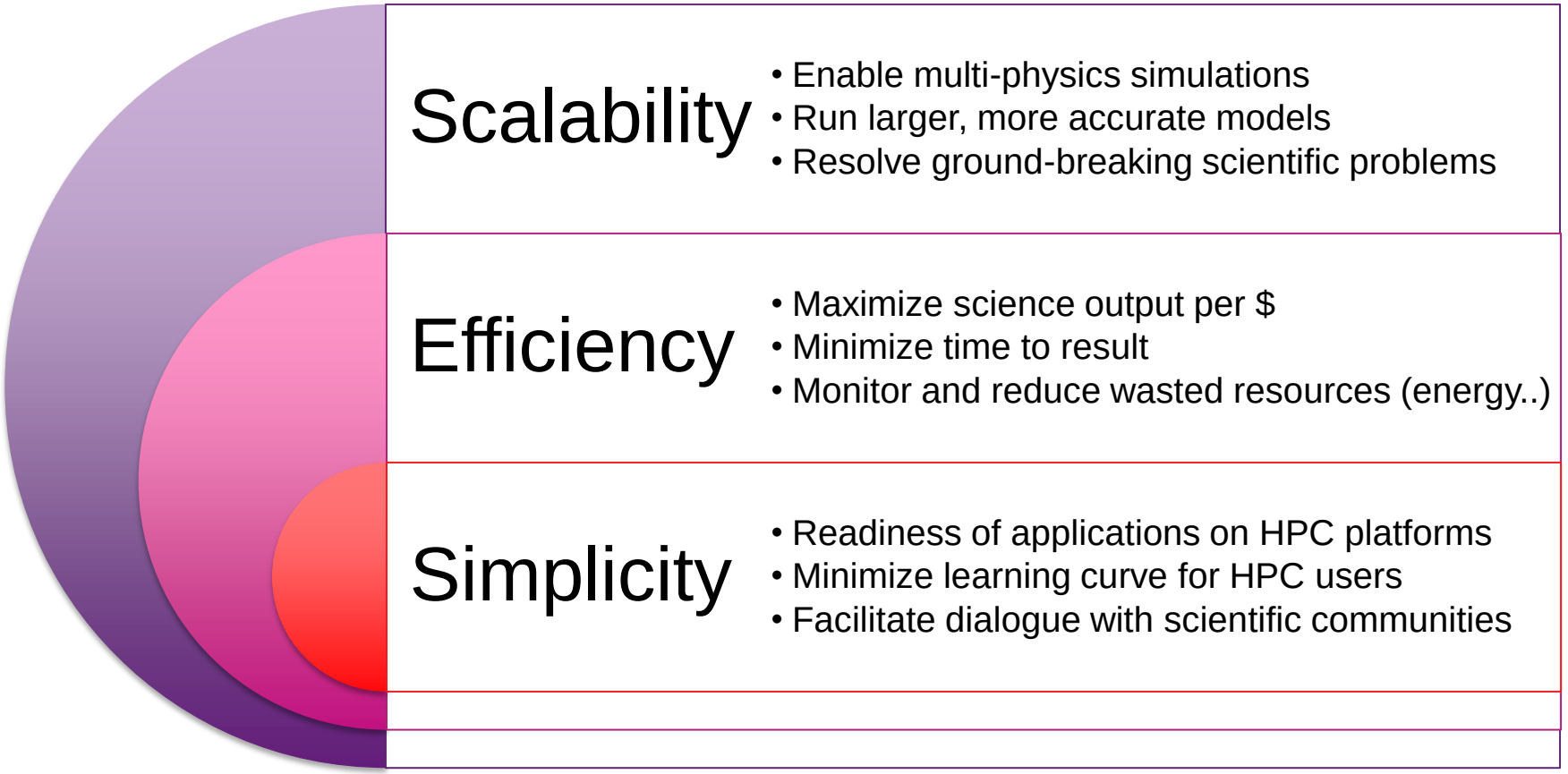
Demands are evolving



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Allinea's vision

- **Helping maximize HPC production**
  - Reduce HPC systems operating costs
  - Resolve cutting-edge challenges
  - Promote Efficiency (as opposed to Utilization)
  - Transfer knowledge to HPC communities

- **Helping the HPC community design the best applications**
  - Reach highest levels of performance and scalability
  - Improve scientific code quality and accuracy

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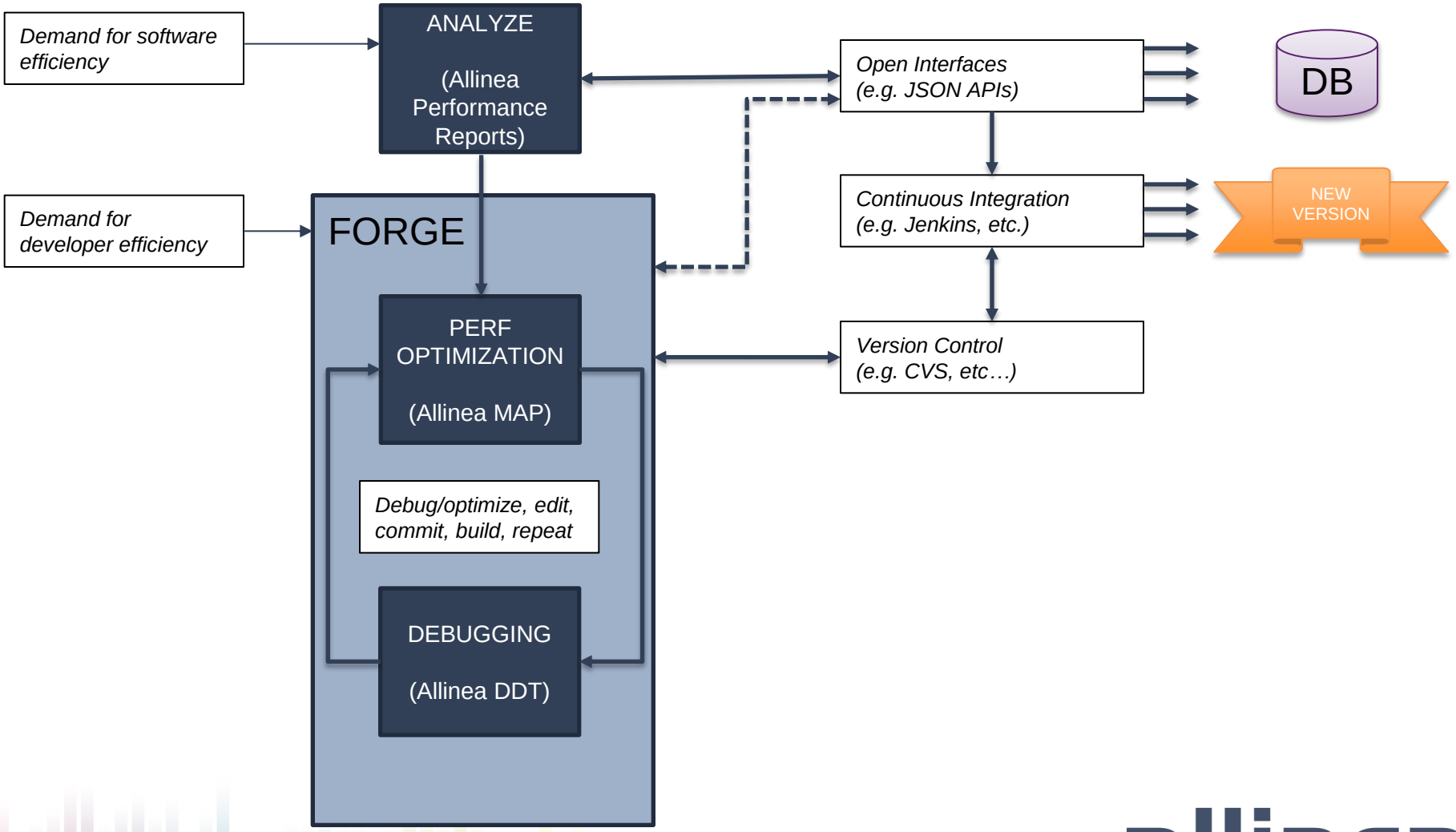
Development process: tools-centric view



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Allinea MAP and CrayPAT : a great synergy

Simple optimization with Allinea MAP

- Characterize performance at-scale with a simple GUI tool
- See which lines of code are hotspots
- Identify common problems at once

Prepare optimization strategy with Allinea MAP

- Document performance issues to communicate to CrayPAT experts
- Identify loop(s) to instrument with CrayPAT API
- Identify CrayPAT performance counter(s) to record

Fine tune the code with CrayPAT

- Retrieve low-level details with CrayPAT
- Fix up CPU usage to make the code fly

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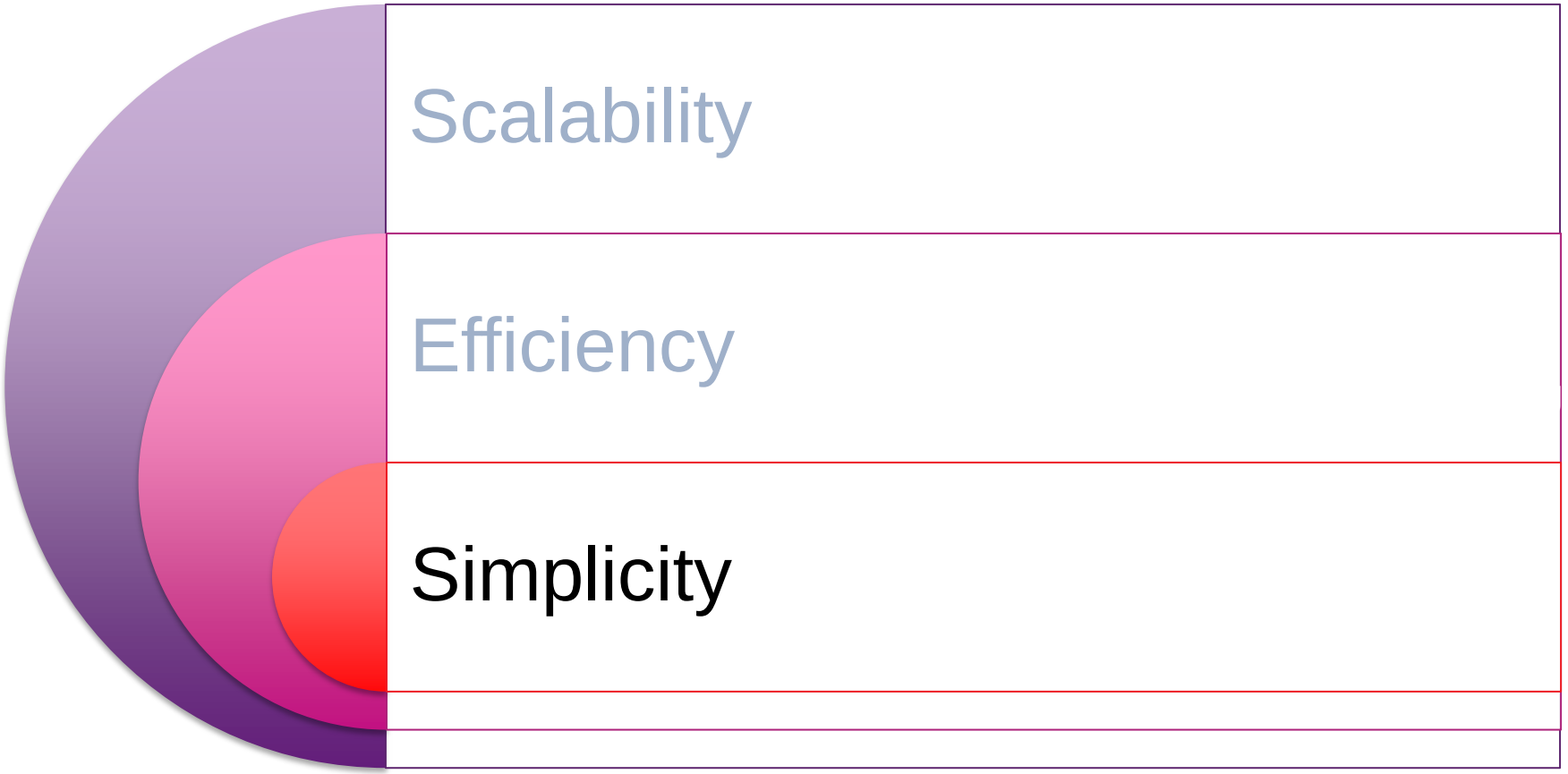
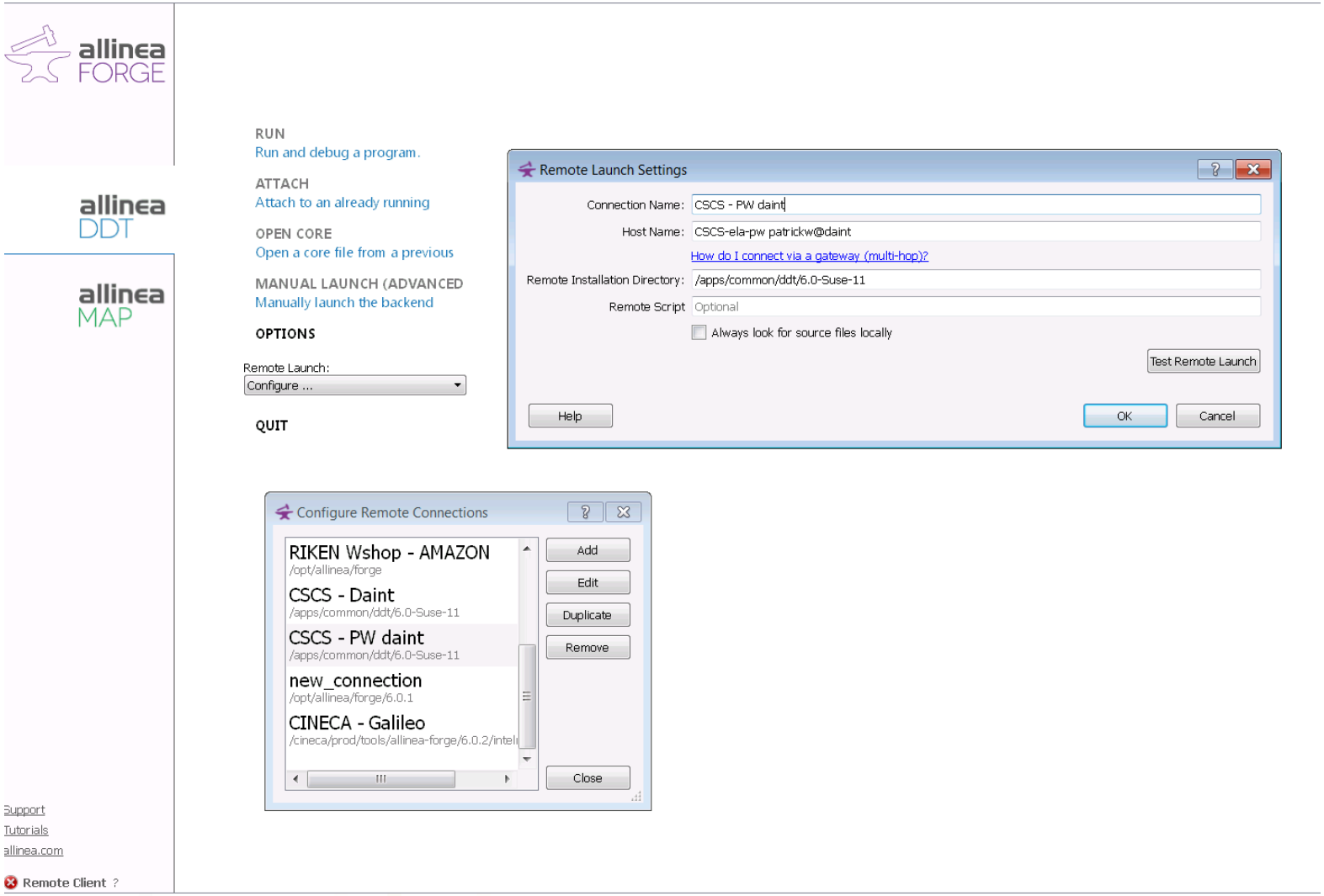
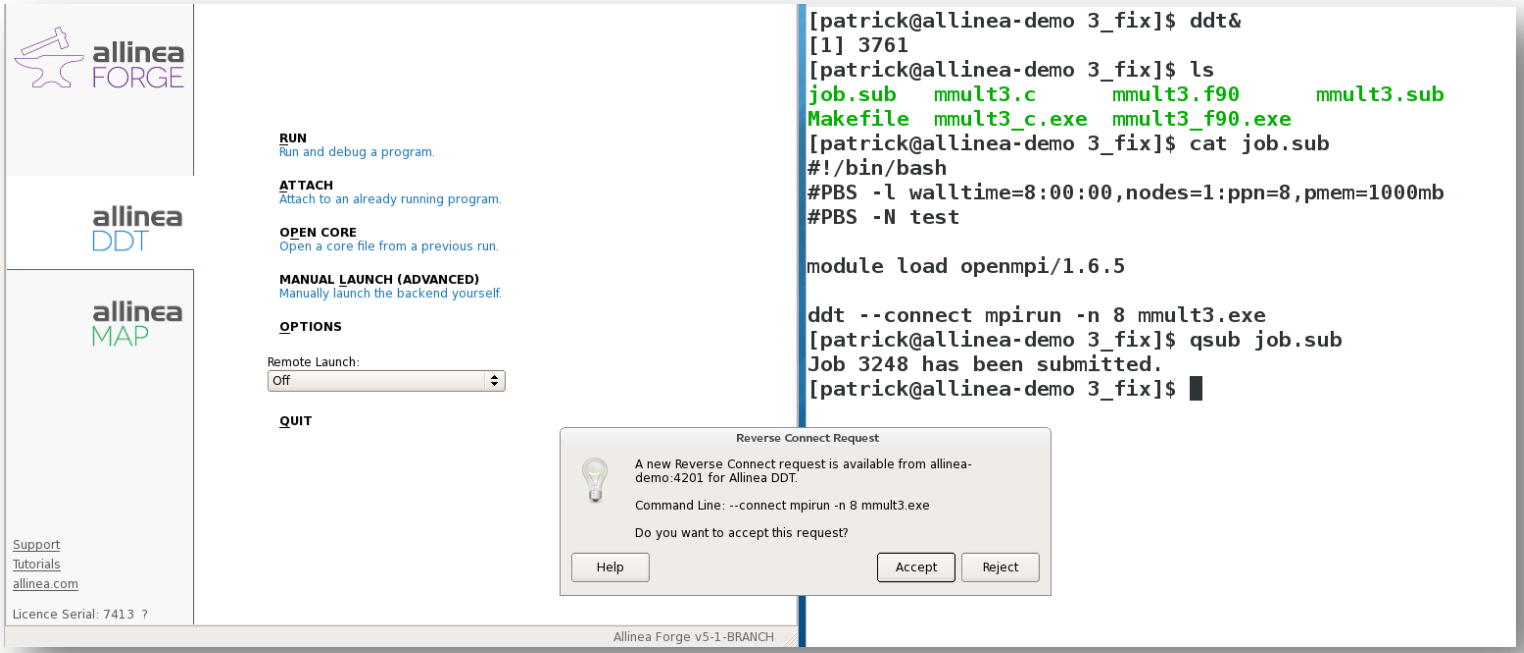
Demands are evolving



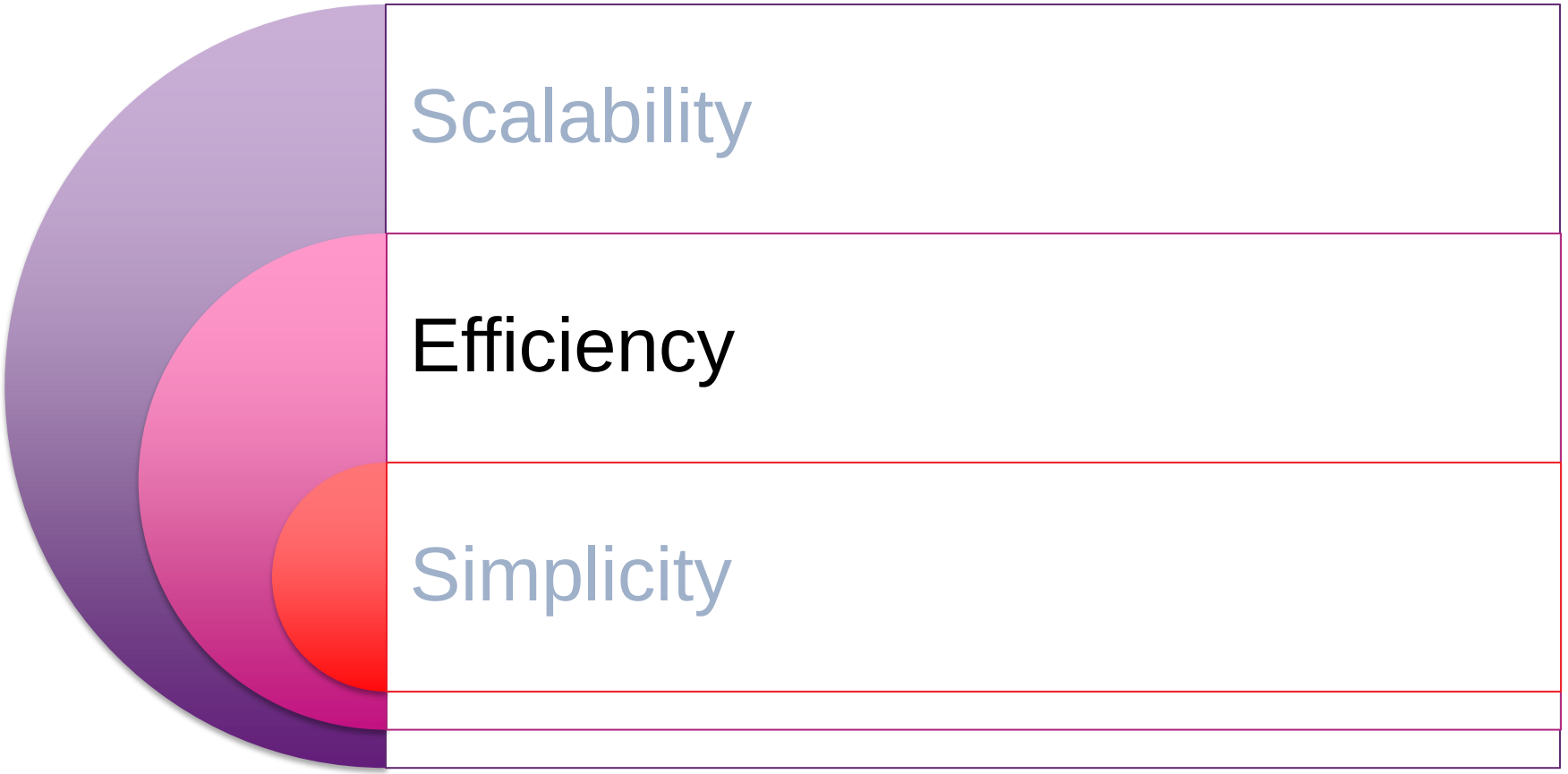
Allinea Remote Client: fast interactive debugging



Reverse connect: the end of template files



Towards better efficiency with Allinea's tools



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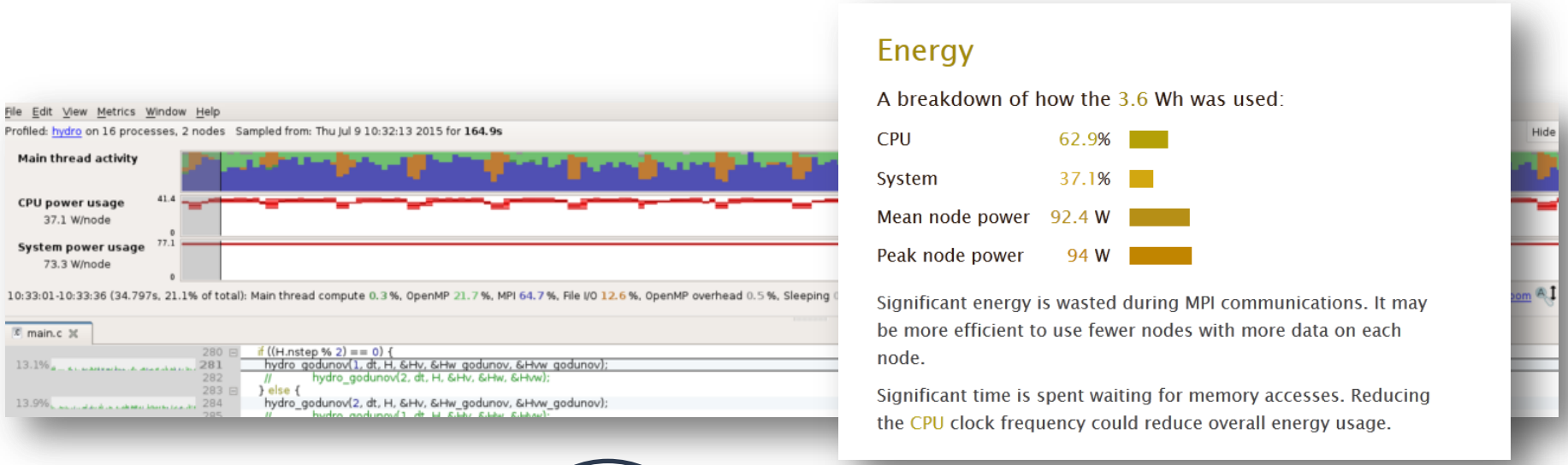
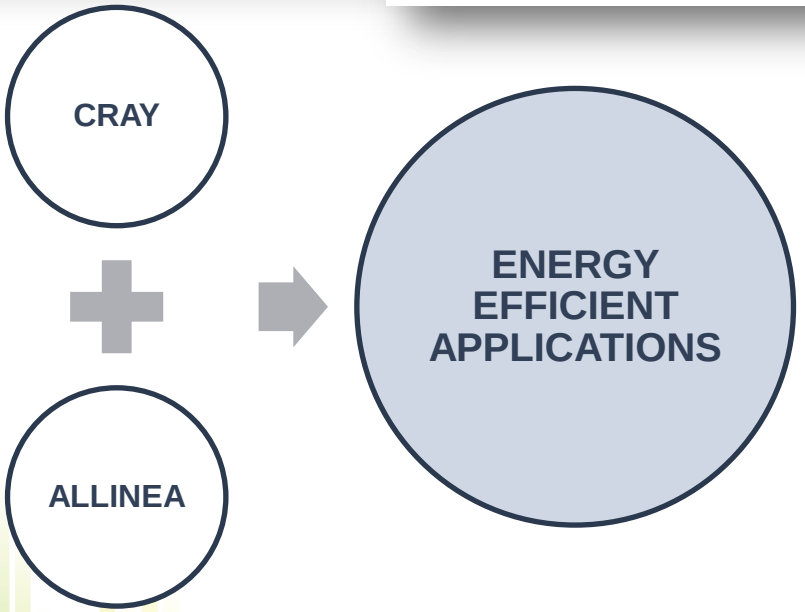
Energy efficiency with Allinea's tools





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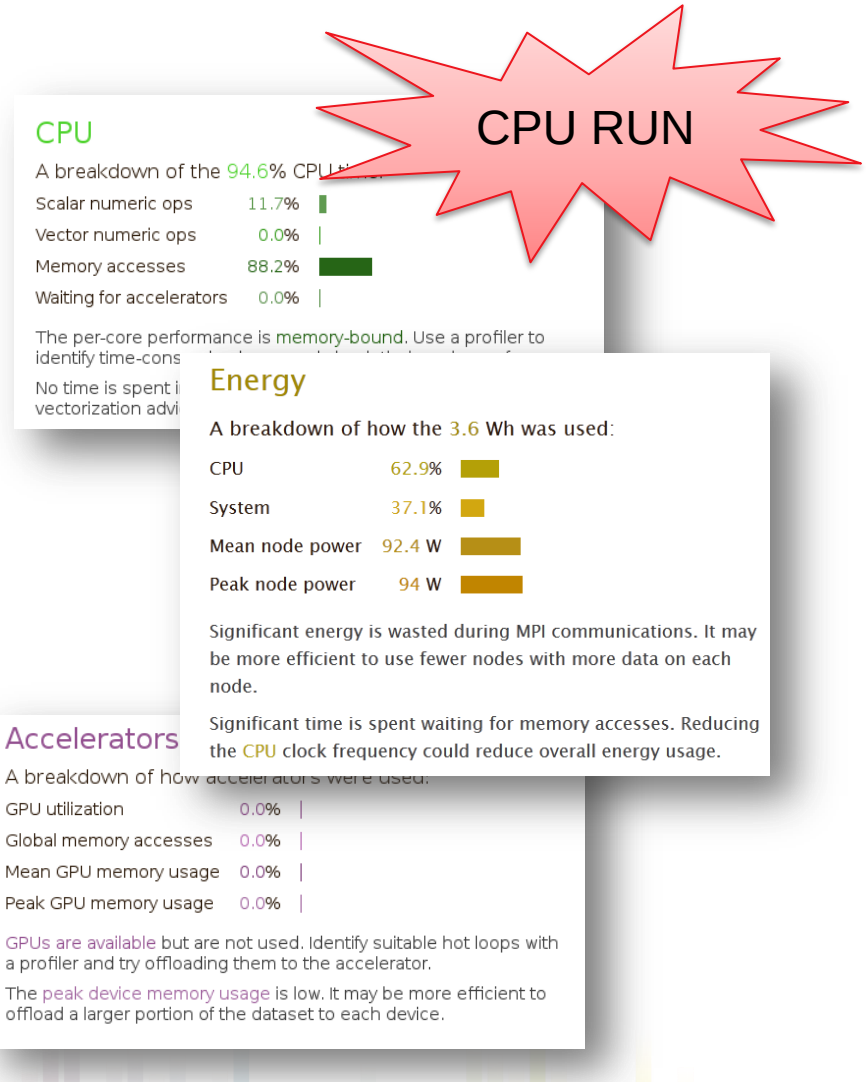
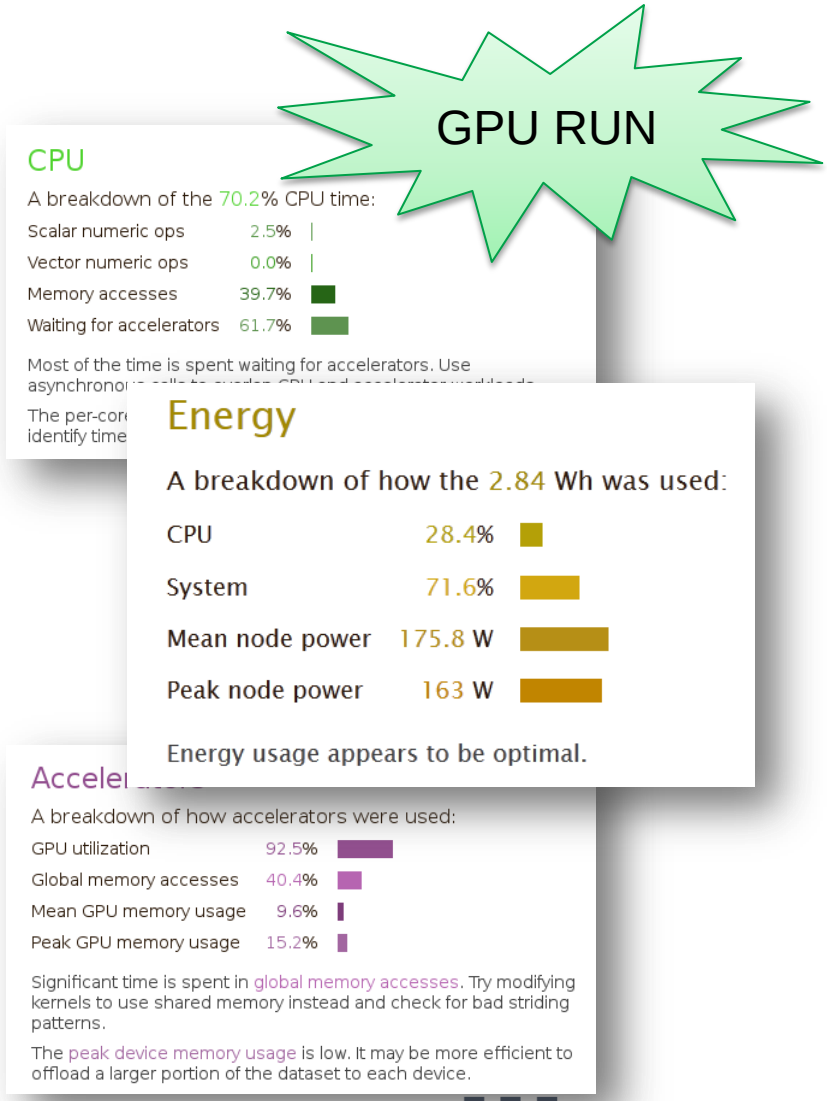
Quantify gains immediately





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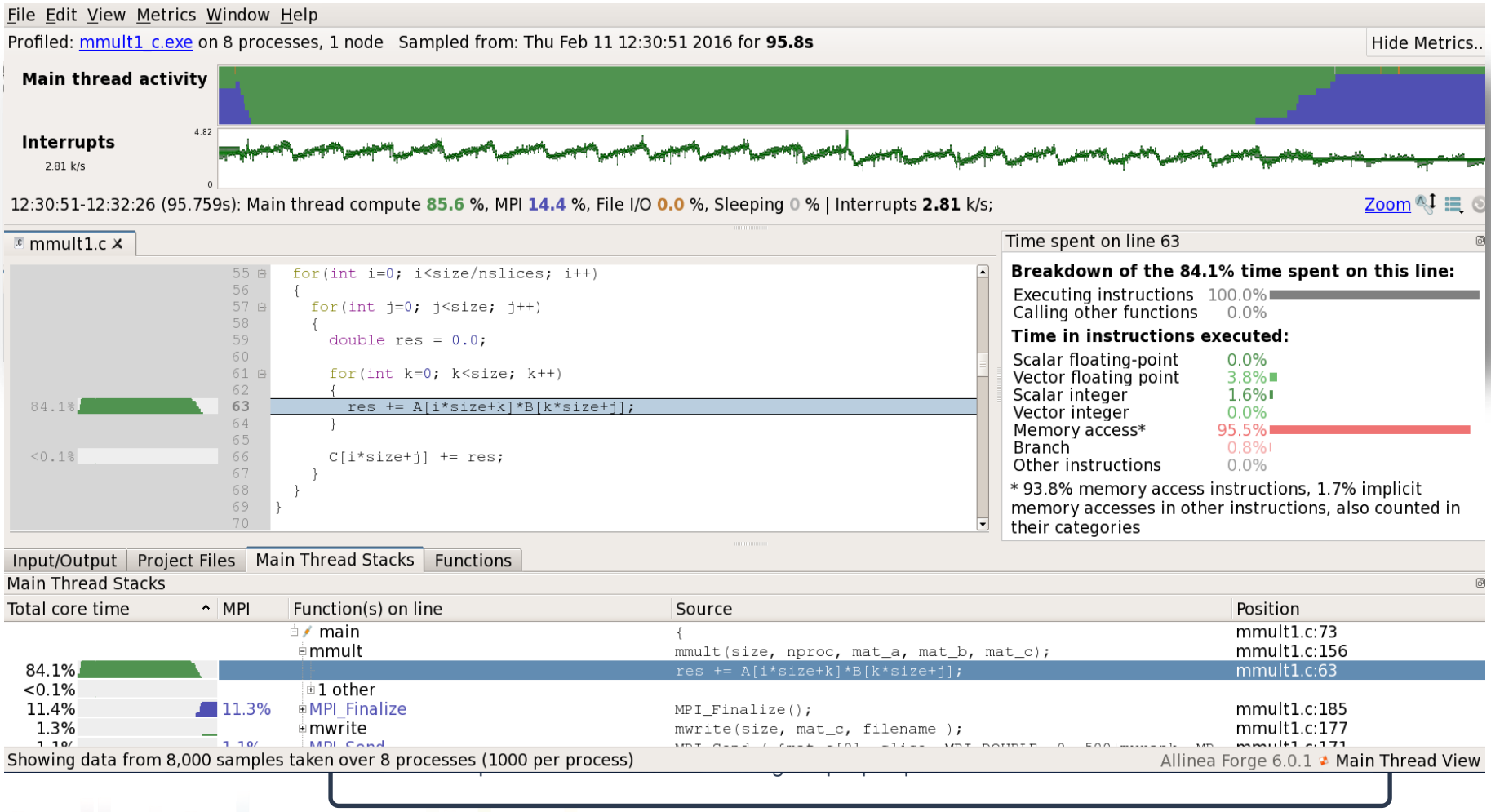
Custom metrics with Allinea MAP



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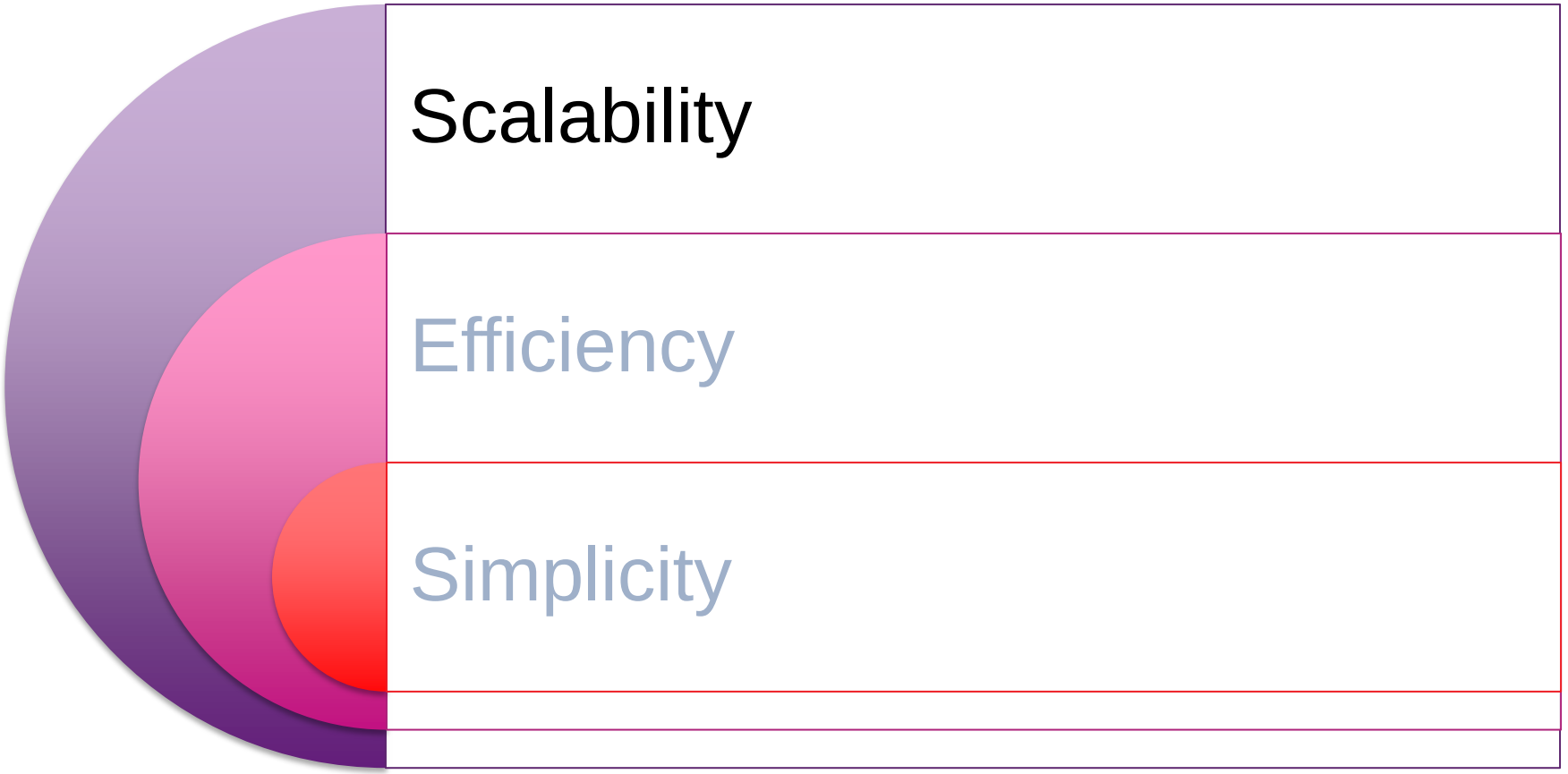
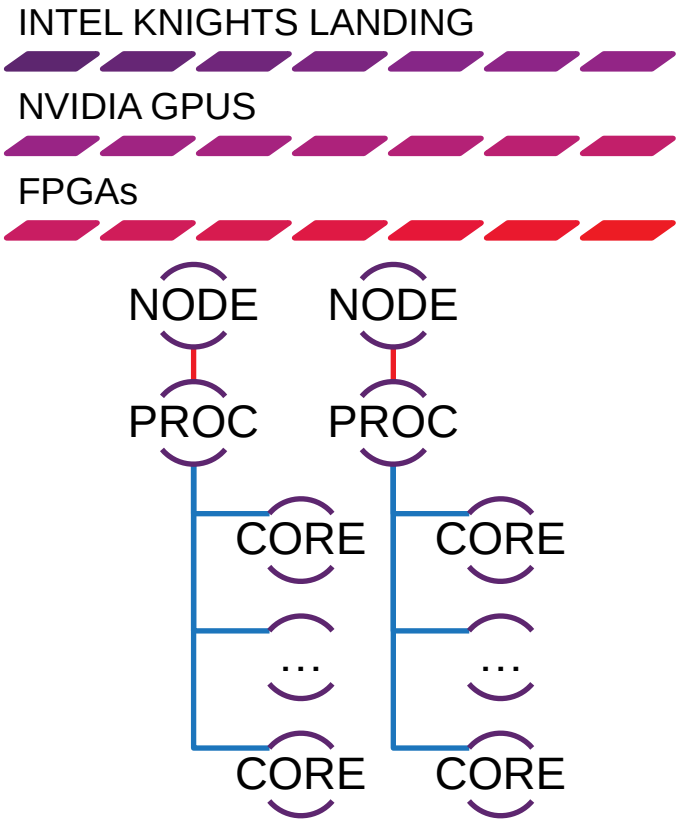
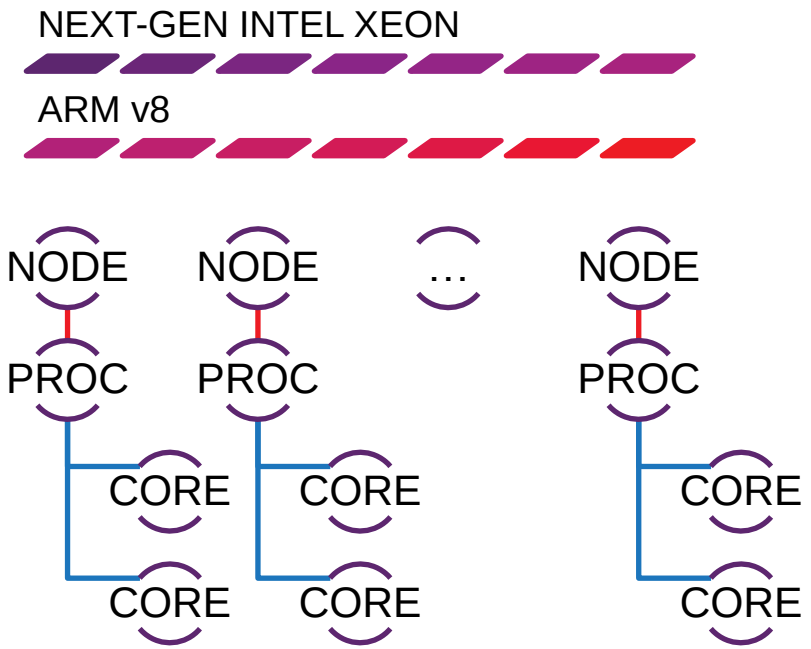
Reducing trapped capacity on next-gen processors



Towards more vertical & horizontal scalability





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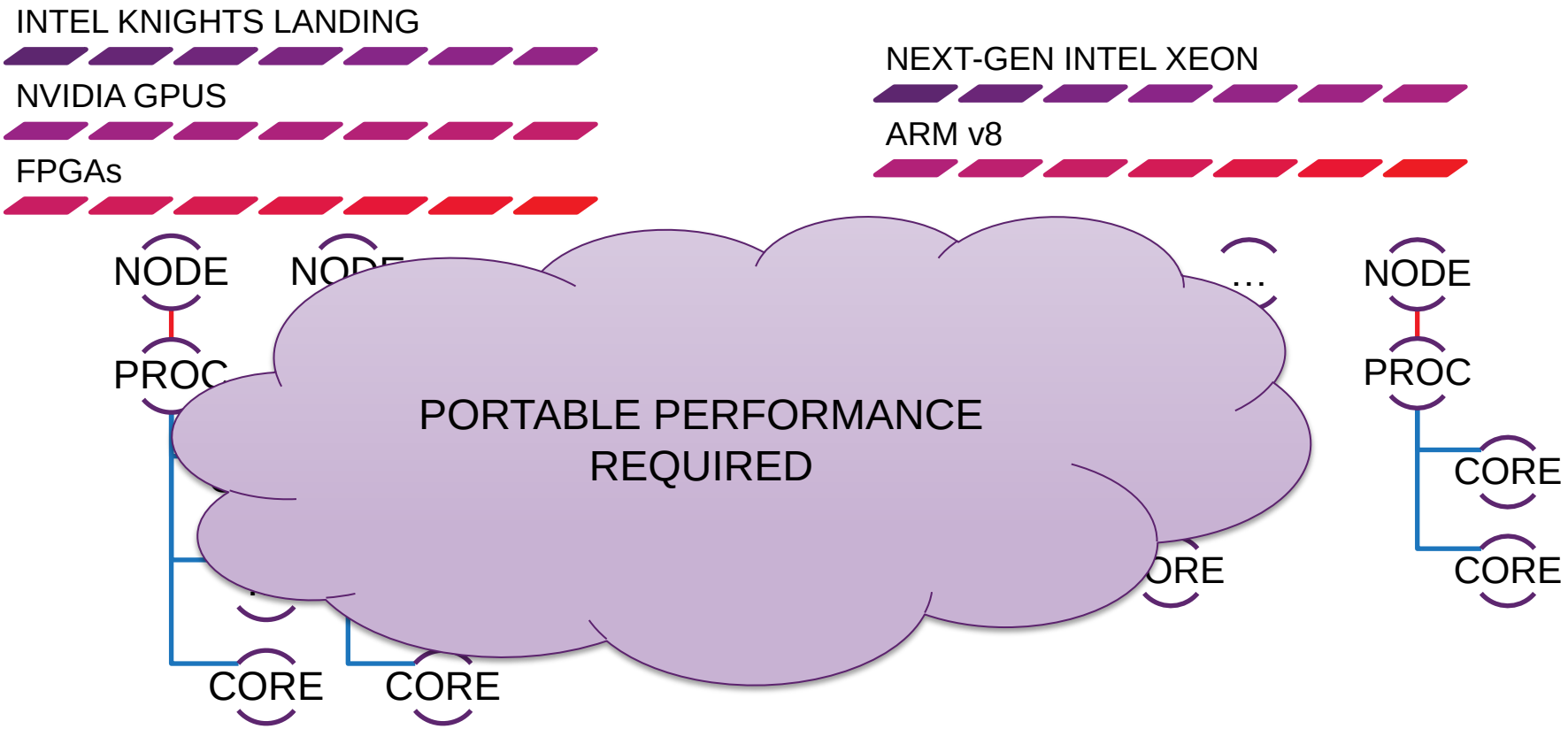

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Support for next generation systems

- **ARMv8 Support**
  - Allinea Forge already available
  - Allinea Performance Reports for ARMv8 scheduled (H2020 ExaNest)
- **Nvidia GPUs Support (currently supported: CUDA 7.5)**
  - CUDA 8.0 expected around GTC 2016
- **Intel KNL Support**
  - Will be supported by Allinea at release

What is coming next? (more under NDA)

Allinea DDT

Advanced memory debugging for Intel Knight's Landing
New HTML crash and leak reports
Export debugging data to continuous integration tools (Jenkins, Bamboo etc)

Allinea MAP

Profile selected ranks only
Toggle view between absolute times & percentages
Export function-level performance to continuous integration tools

Allinea Performance Reports

Profile selected ranks only
Toggle view between absolute times & percentages
Add custom section to your own reports
Export metrics to continuous integration tools

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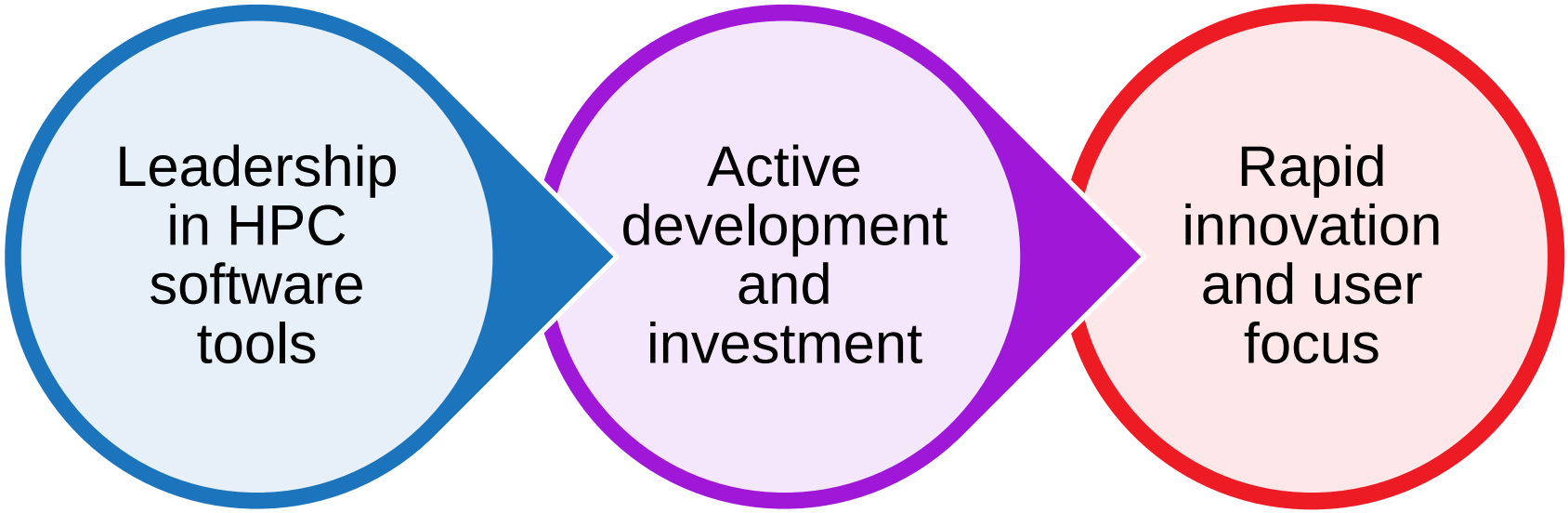
Summary: Allinea provides...



- The only scalable tool suite for HPC
- Innovative, extremely scalable tools with unique visual insight
- Providing what science needs, first.

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Thank you !

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