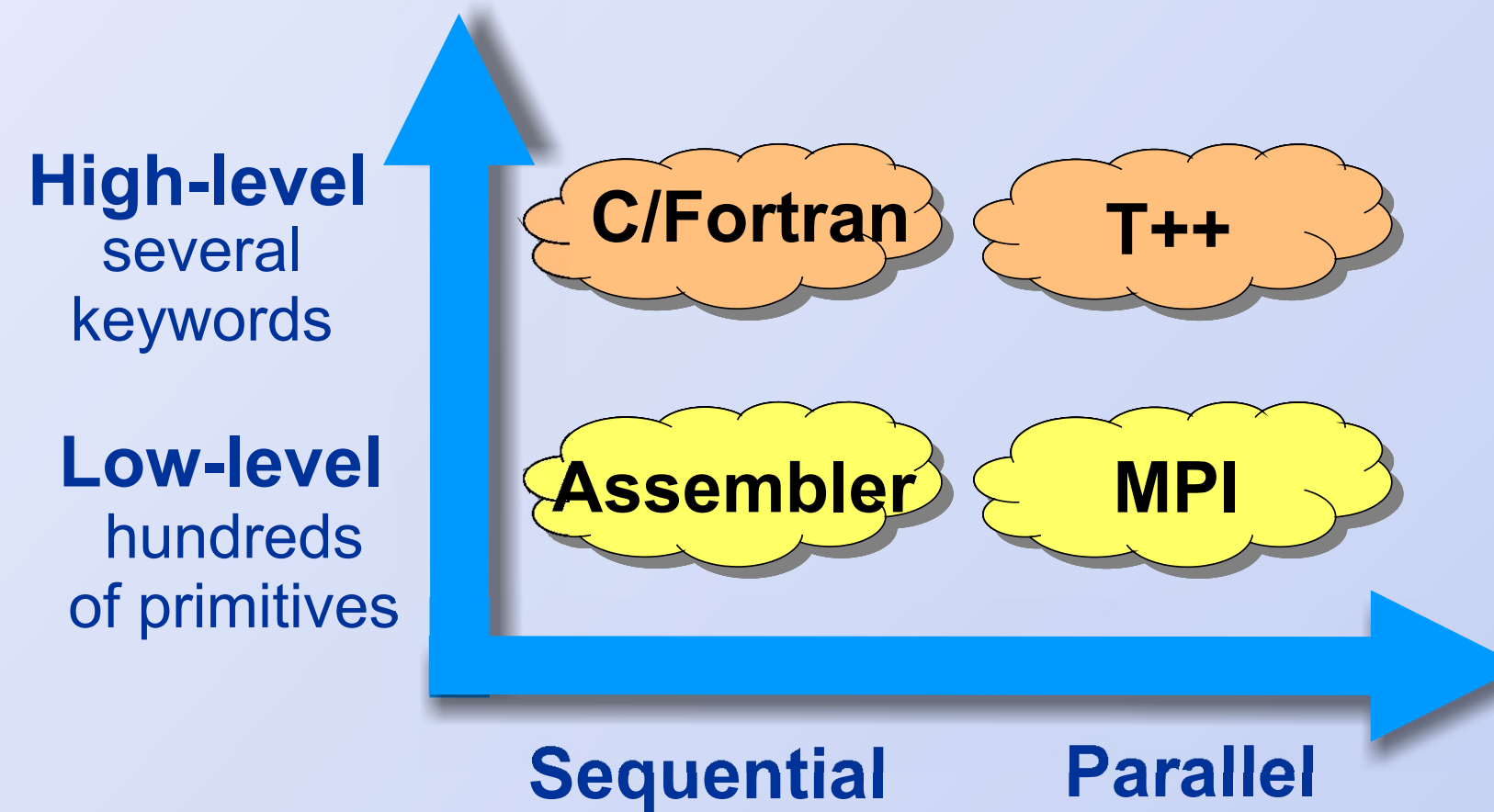




Russian Academy of Sciences Program Systems Institute

Porting OpenTS Parallel Programming System to Windows CCS Platform

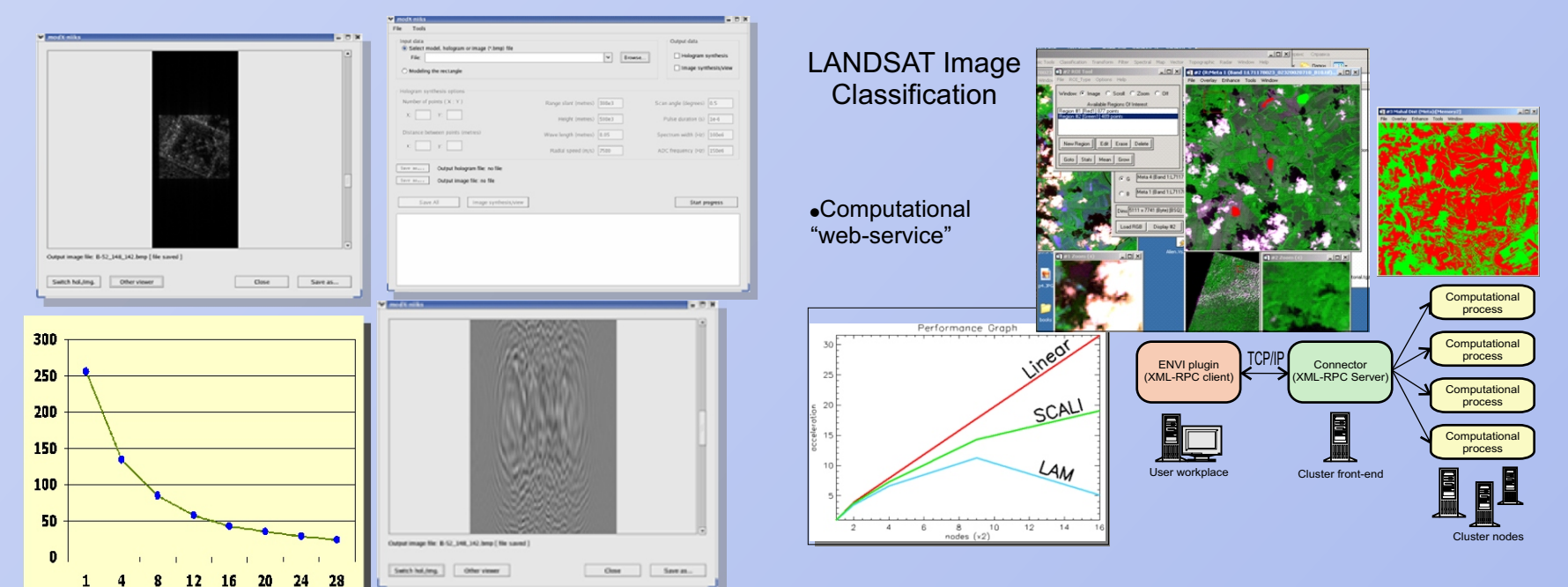
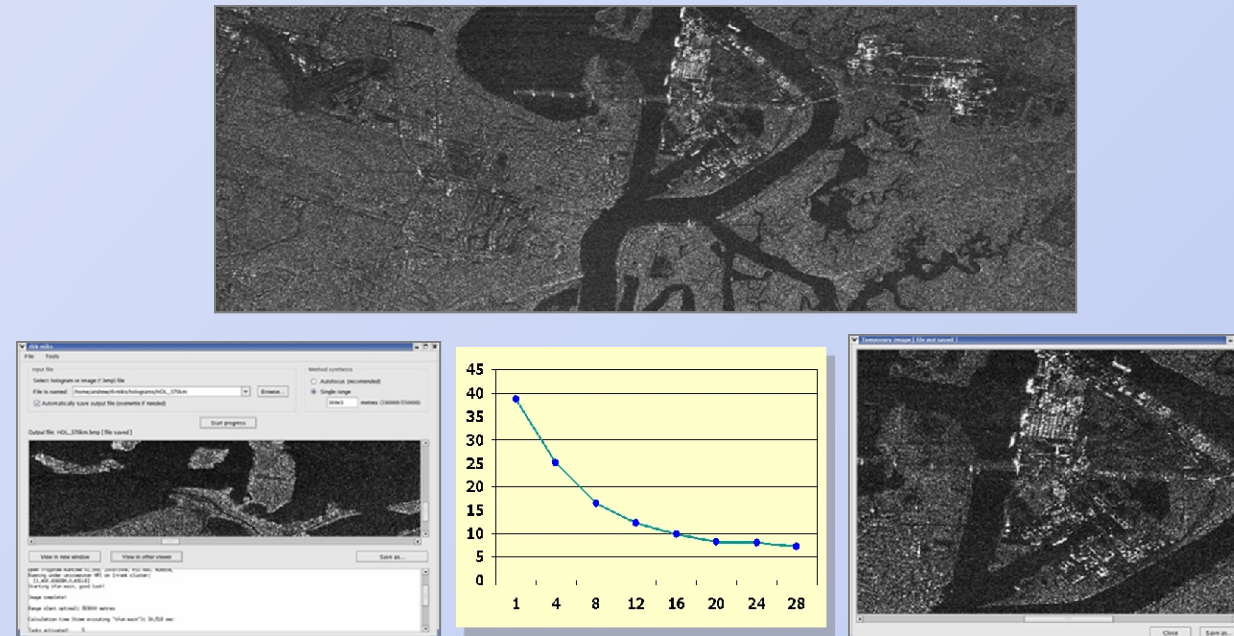
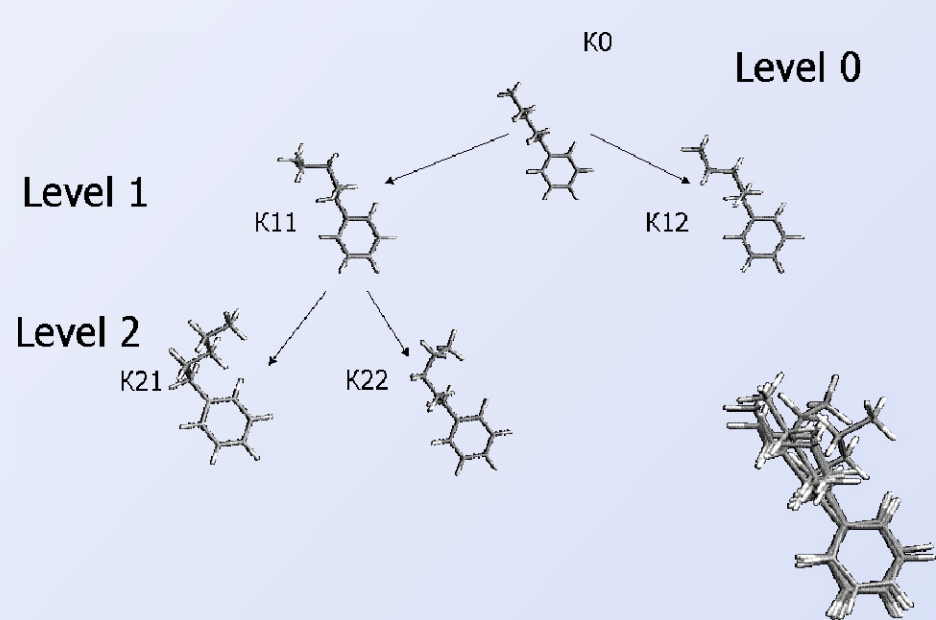
- OpenTS — an advanced tool for parallel and distributed computing.
- High-level approach to parallel programming.
- Automatic dynamic parallelization.
- One solution for different platforms: multicores, SMPs, clusters, grids.
- Efficient lightweight threads support: 1 000 000 threads per processor.
- Multiple MPI implementations are supported.
- PVM and TCP-IP can be used instead of MPI.



(T++) = (C++) + 7 new keywords

- **tfun** — T-function
- **tval** — T-variable
- **tptr** — T-pointer
- **tout** — Output parameter (like &)
- **tdrop** — Make a variable value ready
- **twait** — Wait for a variable value to be ready
- **tct** — Specify T-context

T-applications



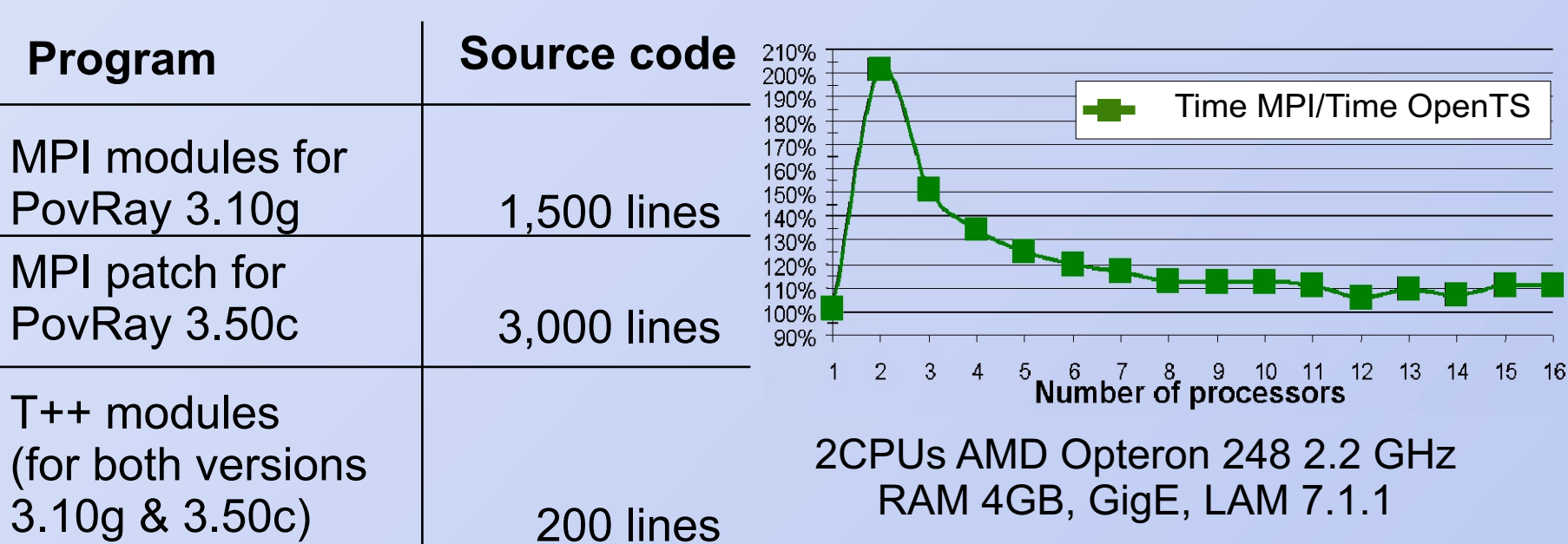
- MultiGen – biological activity estimation
- Aeromechanics
- Protein simulation
- Query engine for XML
- Plasma modeling
- AI-applications
- Remote sensing applications

OpenTS vs MPI: Case Study

2005 — contract with Microsoft. Microsoft chose 2 applications — PovRay and ALCMD, written by MPI experts. Goal — 2-3 people in 2 months should rewrite them in T++: up to 30% performance loss is tolerable, T++ source code should be more compact, readable and reliable than MPI code.

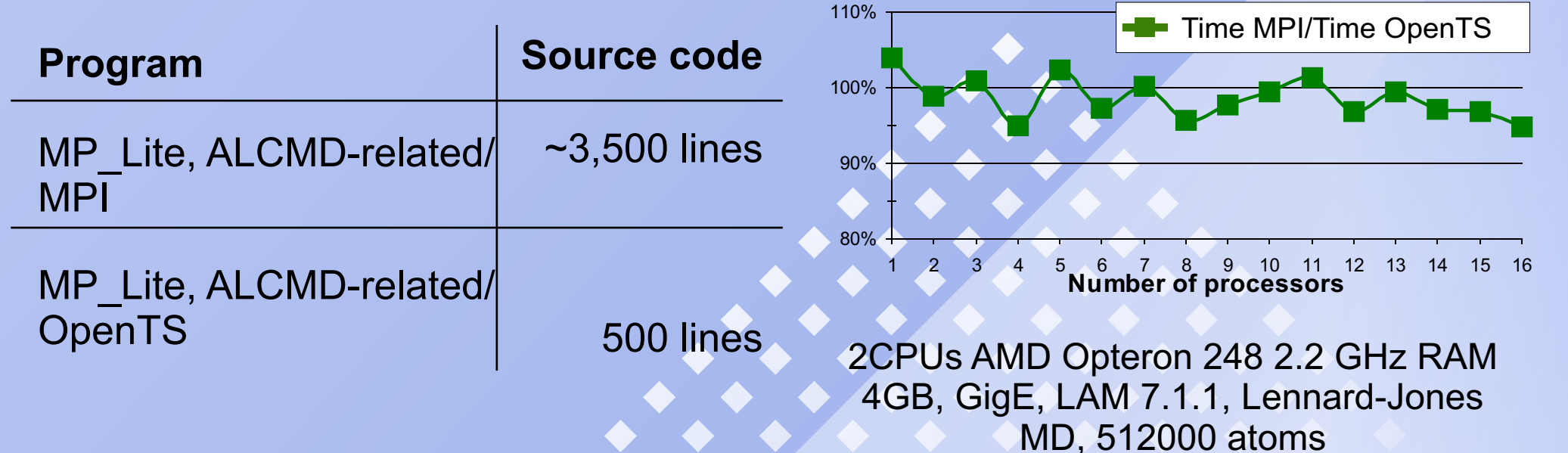
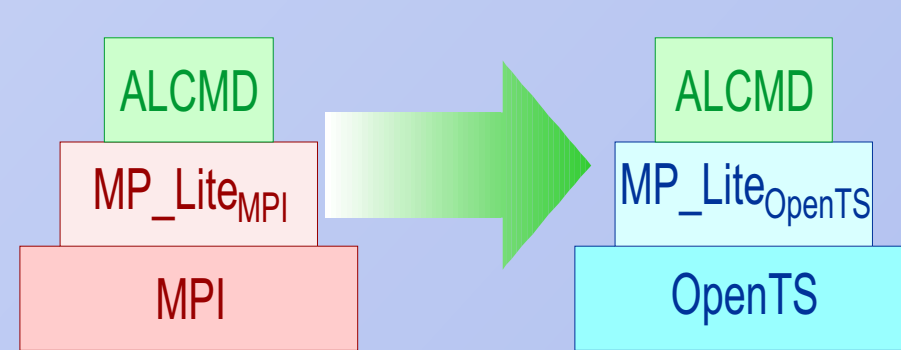
Case study results for POVray

- Source code is 7-15 times more compact and simpler
- OpenTS is useful for developing applications (like POVray)



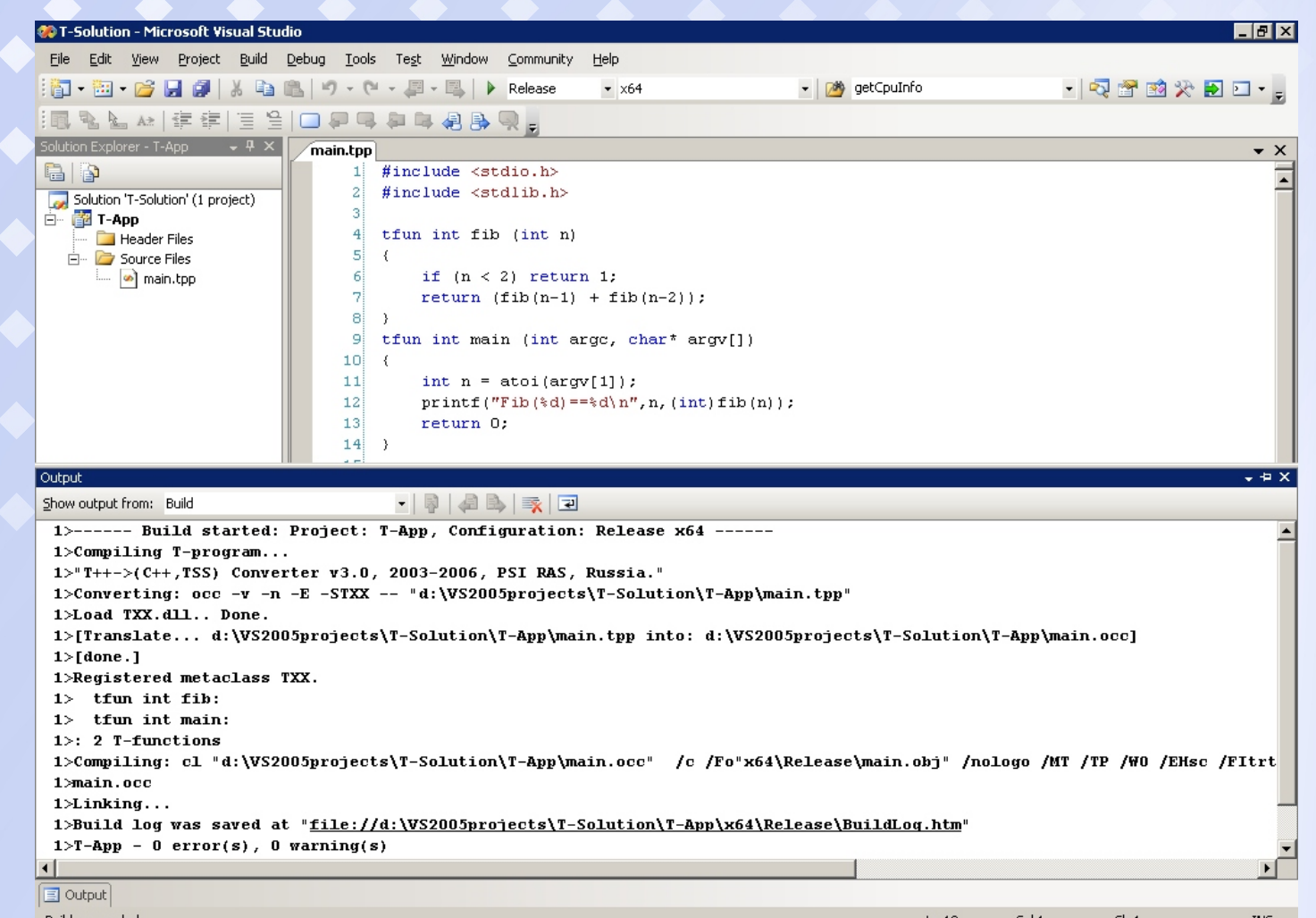
Case study results for ALCMD

- Performances comparable (difference is ±10% in most cases)
- OpenTS is useful for developing libraries (like MP_Lite)



Porting OpenTS to Windows

- 2006 — contract with Microsoft about porting OpenTS to Windows Compute Cluster Server
- OpenTS will be available under FreeBSD license
- X86 and AMD64 platforms are currently supported
- Integration into Microsoft Visual Studio 2005
- Two ways for building T-applications: command line and Visual Studio IDE



ADDRESS

Research Center for
Multiprocessor Systems
Program Systems Institute
Russian Academy of Sciences

Pereslavl-Zalesky
Yaroslavl Region
Russia, 152020
Tel/Fax: +7 (48535) 98064
E-mail: abram@botik.ru
Web-site: <http://www.botik.ru/PSI/RCMS>

