

VSC Training Course: Parallelization with MPI

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Vienna Scientific Cluster
vsc.ac.at

On clusters and distributed memory architectures, parallel programming with the Message Passing Interface (MPI) is the dominating programming model. This 3 days course teaches parallel programming with MPI starting from a beginners level. Hands-on sessions (in C and Fortran) will allow users to immediately test and understand the basic constructs of the Message Passing Interface (MPI).

This course has been originally developed by Rolf Rabenseifner from the High-Performance Computing-Center Stuttgart (HLRS) and is organized in cooperation with HLRS.

(Content Level: 70% for beginners, 30% advanced)



Agenda

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[1] Slide 1 / 4

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VSC: MPI course — Agenda — 1st day

8:45 **Registration & Getting Ready for the Course**

9:00 **Welcome / Introduction** [2,7] (talk)

9:15 **MPI – Introduction to the Message Passing Interface** [3] (talk)

9:30 **Chapter 1: MPI Overview** (talk)

10:15 **Chapter 2: MPI Process Model** (talk+practical)

11:30 **Coffee**

11:45 **Chapter 3: Messages and Point-to-Point Communication** (talk+practical)

13:00 **Lunch**

14:00 **Chapter 4: Non-Blocking Communication** (talk+practical)

15:30 **Coffee**

15:45 **Chapter 5: Fortran and MPI** [4] (talk – only for Fortran participants)

16:30 **End (of 1st day)**



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[1] Slide 2 / 4

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VSC: MPI course — Agenda — 2nd day

- 9:00 **Chapter 6: Collective Communication** (talk+practical)
- 10:15 **Coffee**
- 10:30 **Chapter 8-(1): Groups & Communicators** [3 cont.] (talk+practical)
- 11:45 **Chapter 9: Virtual Topologies** (talk+practical)
- 13:00 **Lunch**
- 14:00 **Chapter 8-(2): Re-numbering on a cluster** (talk)
- 14:15 **Optimizing MPI communication: a real world example** (talk)
- 14:30 **Chapter 12-(1): Derived Datatypes** (talk)
- 15:00 **Coffee**
- 15:15 **Chapter 13: Short Tour: HPC I/O – Parallel File I/O** (talk)
- 15:45 **Chap. 7, 14-17: Short Tour: Other MPI Topics** (talk)
- 16:00 **The Vienna Scientific Cluster (VSC)** [5] (talk)
- 16:30 **End (of 2nd day)**



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[1] Slide 3 / 4

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VSC: MPI course — Agenda — 3rd day

- 9:00 **Chapter 10: One-sided Communication** [3 cont.] (talk+practical)
- 10:45 **Coffee**
- 11:00 **Chapter 11-(1): Shared Memory One-sided Communication** (talk+practical)
- 12:30 **Lunch**
- 13:30 **Best Practice for Code Parallelization** [7] (talk)
- 14:30 **Coffee**
- 15:00 **Parallel Programming Models** [6] (talk)
- 15:45 **Summary / Q & A** [8] (talk)
- 16:00 **End (of course)**



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[1] Slide 4 / 4

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