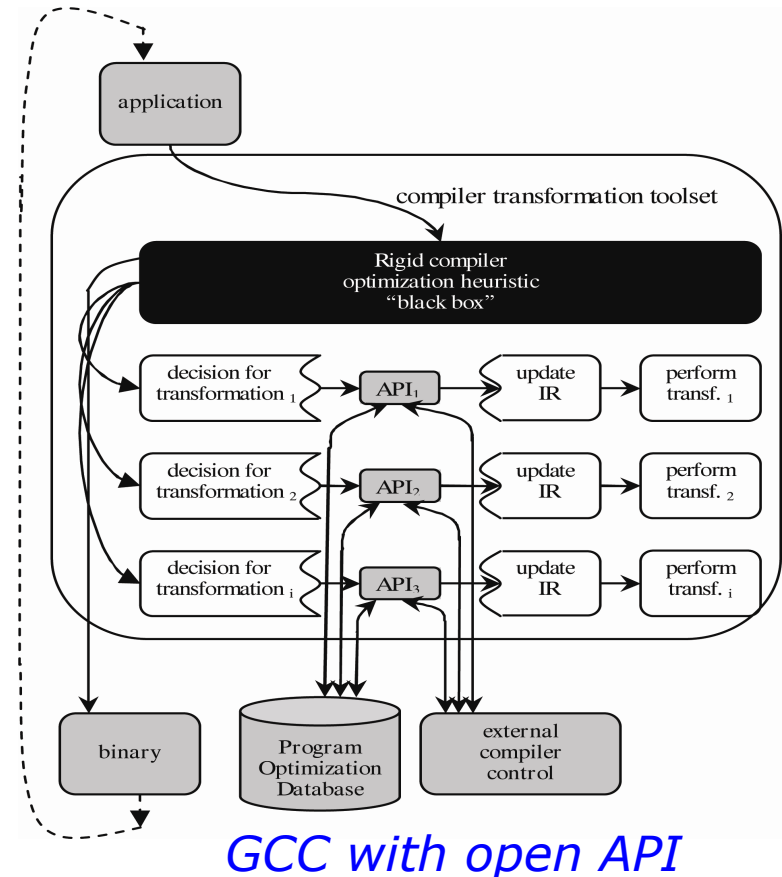


# Compilation Platform

- GCC as a common research platform
- Powerful dissemination vehicle for HiPEAC
- Maximal impact on the software industry

## Interactive Compilation Interface

- Build and extend an API to plug research tools into GCC
- Support iterative and machine learning compilation



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## Composable parallel programming

- Transactional memory
- Data-flow and synchronous
- Build on existing OpenMP support

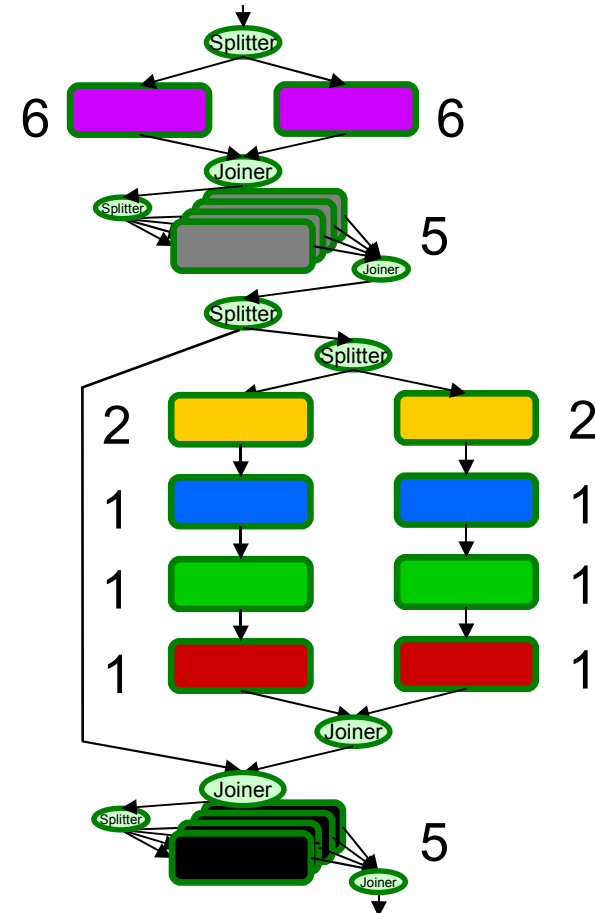
```
main() {  
    int i, sum = 0;  
    #pragma omp parallel for  
    for (i = 0; i < 10; i++) {  
        #pragma omp atomic  
        sum += i;  
    }  
}
```

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## Advanced intermediate representation

- Extend GIMPLE-SSA to support analysis and transformation of parallel programs
- Adaptive parallelization (compile-time and run-time)
- Global, link-time and dynamic optimization



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## Performance model for multicores

- Drive high-level optimizations (parallelism, locality, algorithms)
- Analytical performance prediction and profitability models
- Interaction with simulation platform (machine description and analytical modeling)
- Design-space exploration

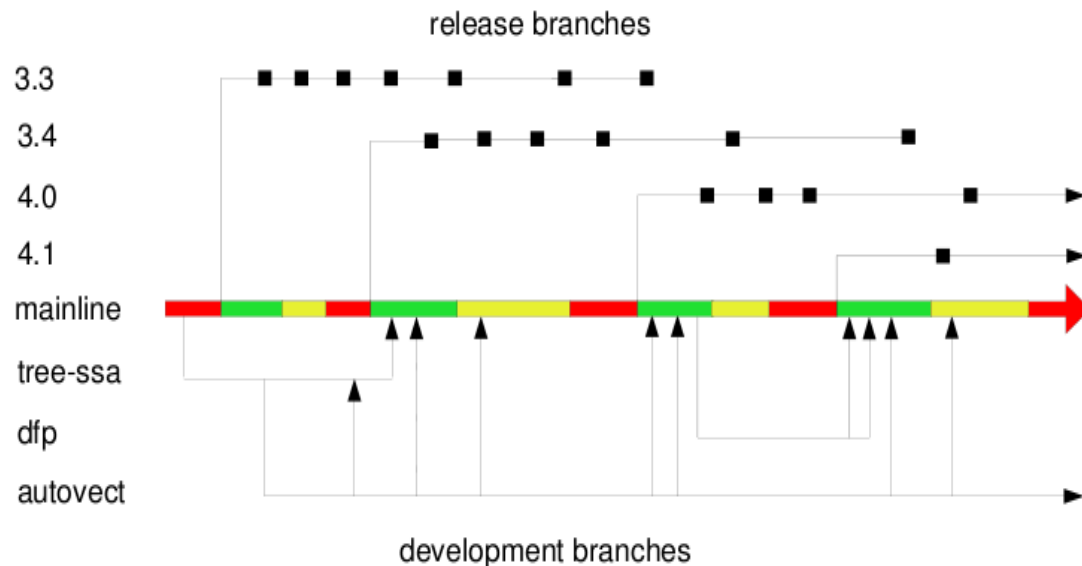
# Compilation Platform

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## Platform support

- HiPEAC branch(es)
- Mutualize version synchronization (fast evolving code base)
- Training and development support
- Work with the community of GCC developers (in Europe and worldwide)



# Compiler Platform: Agenda

- GCC
  - Ongoing research
  - Ongoing development
- Other mutual-interest platforms?
- Proposed collaborative research
- Proposed actions
  - Mutualization
  - Coordination and animation

# Compiler Platform: Agenda

- FP7 Braga challenges
  - Parallelism
  - Customization
  - Virtualization
- Adaptive compilation cluster
  - Replace heuristics with external drivers
  - Provide high-impact transformations
  - Feature extraction
  - Feedback tools

# Compiler Platform: Agenda

- Subscribe to the cluster's web group
  - Check the wiki pages
  - Update it (ask for write permission)
- 2<sup>nd</sup> GREPS workshop
- Roadmap
  - Document will shape future calls
  - Cluster delegate?
  - Final cluster feedback by October 2008

# Compiler Platform: Agenda

- HiPEAC engineer/postdoc
  - 2008: overlap with HiPEAC1
  - 2009-2011: HiPEAC2
  - Tasks