

# Tools

- Command line tools
- CASE – Computer Aided Software Engineering
- IDE – Integrated Development Environment
- MDE – Model Driven Engineering

# Command Line Tooling

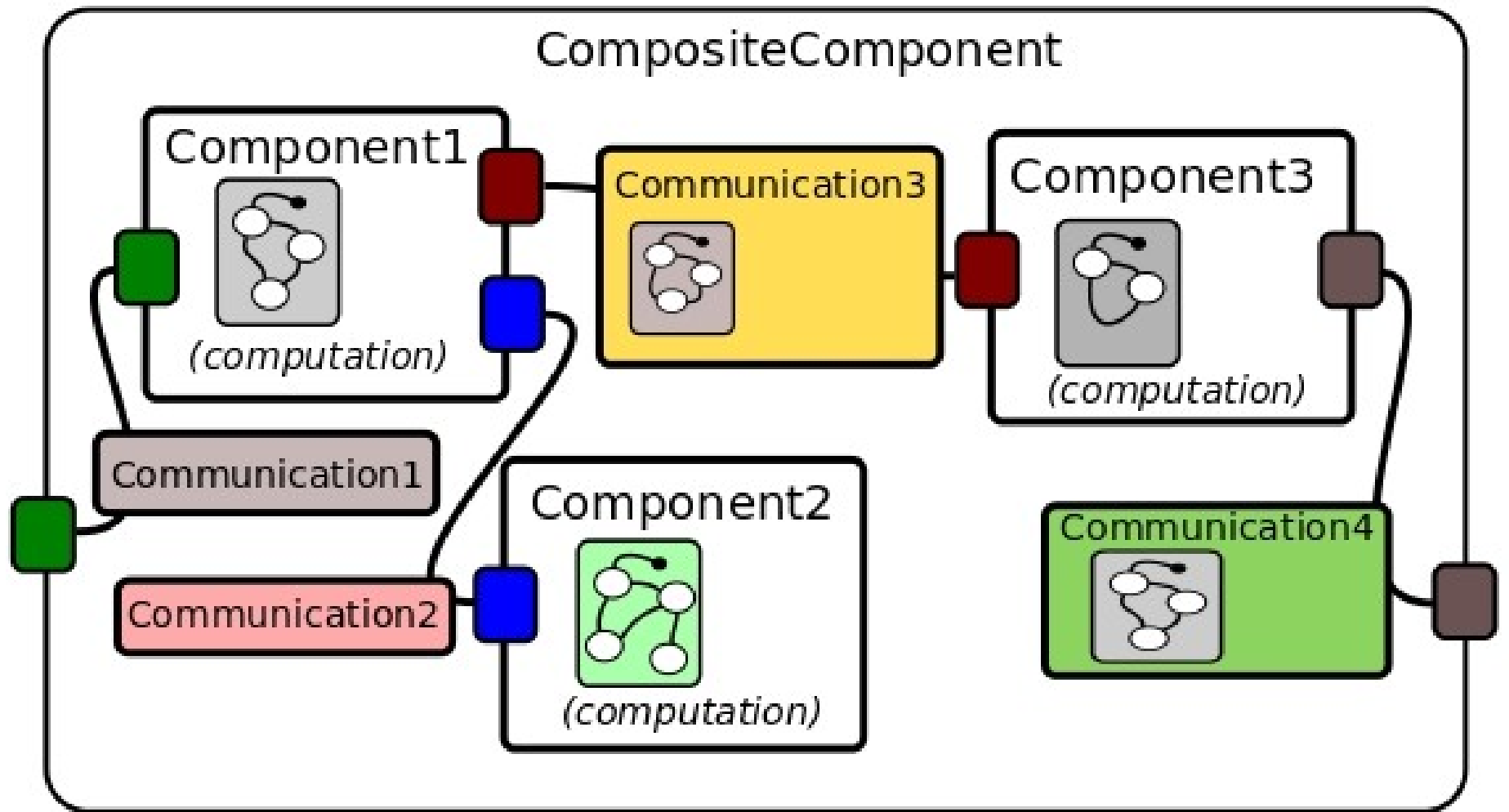
- Un\*x/Linux is preferred operating system.
- C/C++ programming
- GNU Toolchain
  - C++ programming
  - C programming and Unix
  - GNU Tooling

# Integrated Development Environment

- IDE provides centralized graphical user interface (GUI) for development.
- May use underlying command line tooling.
- Supports the programming aspect of building software.
- Ideally can be used in different software development methodologies.

# Programming Paradigms

- Object oriented programming.
- Component based development.



*Structural model + Communication + Coordination*

# Model Driven Development

- Provides one more level of abstraction.
- Model represent the system.
- Two approaches:
  - Use standardized meta modeling (UML)
  - Use Domain Specific Language (DSL)

# References

- Eclipse Foundation - <http://www.eclipse.org/>
- Topcased - <http://www.topcased.org/>
- Autosar - <http://www.autosar.org/>
- OMG - <http://www.omg.org/>
- MDA - <http://www.omg.org/mda/>
- Article on MDE - <http://www.cs.wustl.edu/~schmidt/PDF/GEI.pdf>
- Domain Specific Language (DSL) - [http://en.wikipedia.org/wiki/Domain-specific\\_language](http://en.wikipedia.org/wiki/Domain-specific_language)
- Agile Software Development: A gentle introduction - <http://www.agile-process.org/>
- Component Technology in Embedded Systems - <http://www.polberger.se/components/>
- Orocos Project - <http://www.orocos.org/>
- BRICS - <http://www.best-of-robotics.org/>