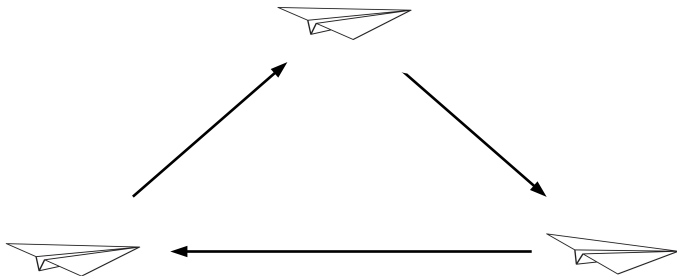


Multi-mode applications on reconfigurable heterogeneous platforms

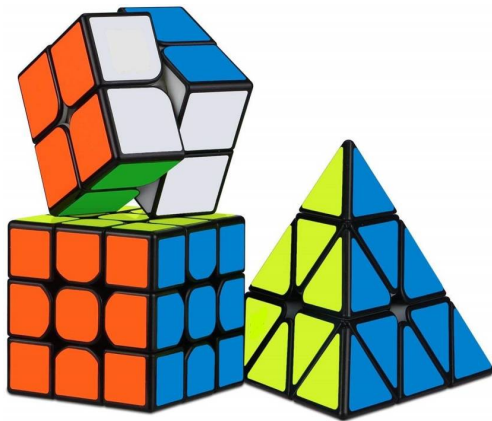
Joël Goossens, Antonio Paolillo, **Xavier Poczekajlo**, Paul Rodriguez

Faculté des Sciences of the Université libre de Bruxelles, Belgium

Multi-mode application



Multiple hardware modes

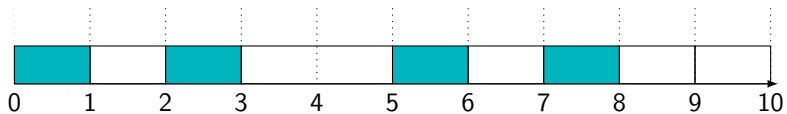


Contributions

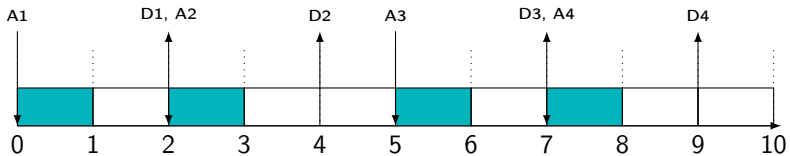
- A new model
- Its first protocol & feasibility test
- A competitive analysis

Model

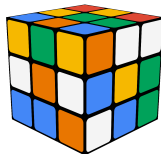
Software model



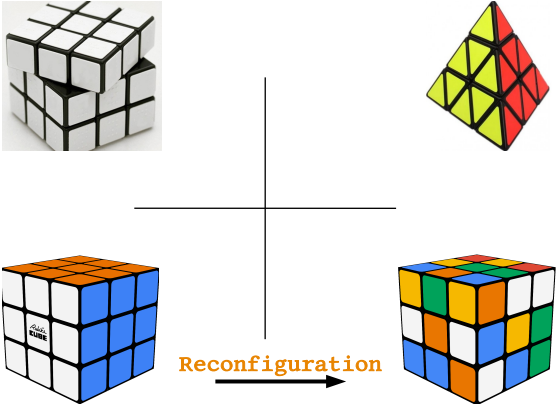
Software model



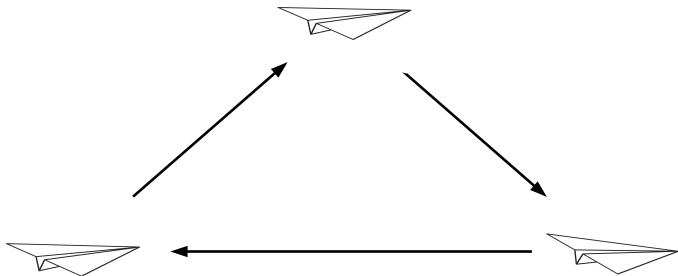
Hardware model



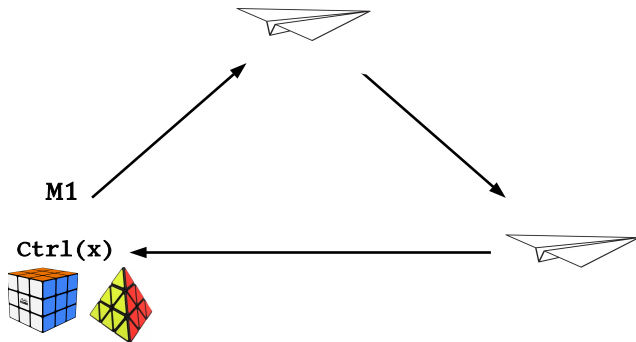
Hardware model



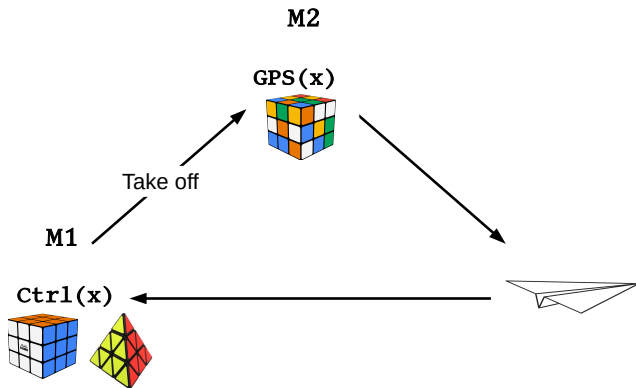
Platform model



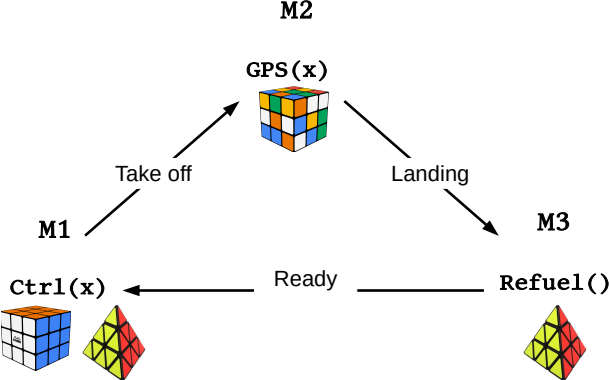
Platform model



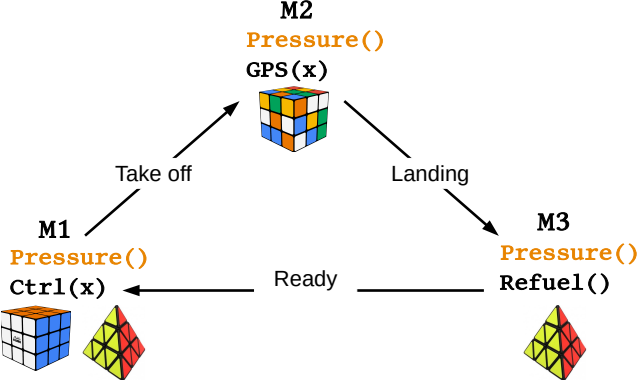
Platform model



Platform model



Platform model

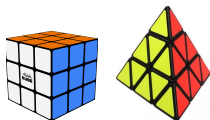


Model summary

M1

M2

M3

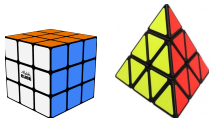


Ctrl(x) - Pressure()



Model summary

M1



Ctrl(x) - Pressure()



M2



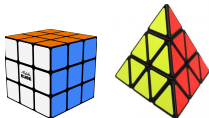
GPS(x) - Pressure()



M3

Model summary

M1



Ctrl(x) - Pressure()



M2



GPS(x) - Pressure()



M3



Refuel() - Pressure()



Model benefits

Hardware requirements

1 mode

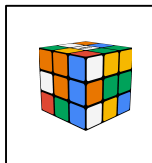
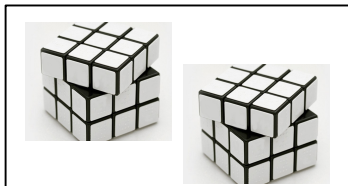
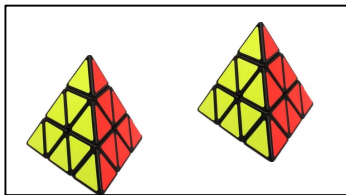
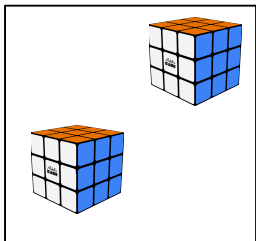


3 modes



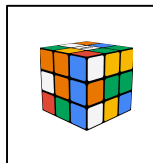
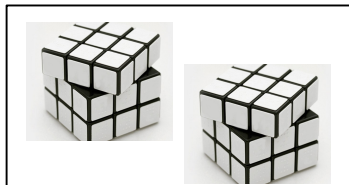
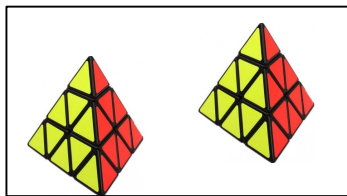
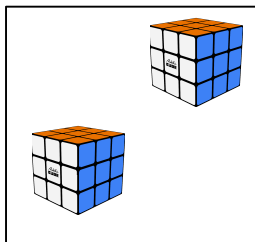
Protocol

Protocol: clustered



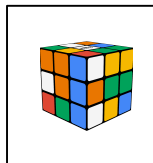
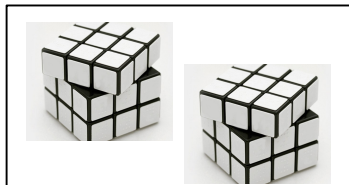
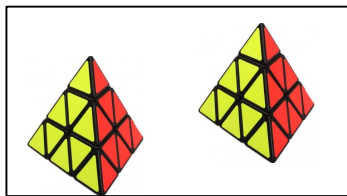
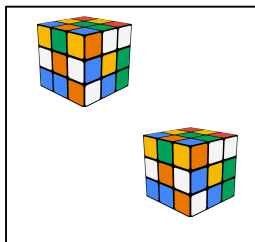
Protocol: computing required reconfigurations

From M^i to M^j : hardware requirements for M^i



Protocol: computing required reconfigurations

From M^i to M^j : hardware requirements for M^j



Protocol: computing required reconfigurations

From M^i to M^j : Required reconfigurations



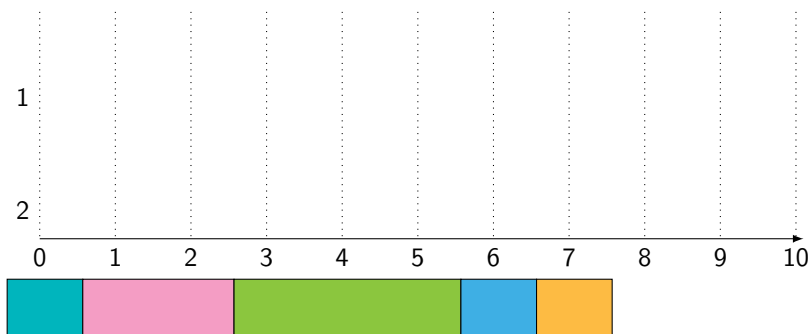
Reconfiguration



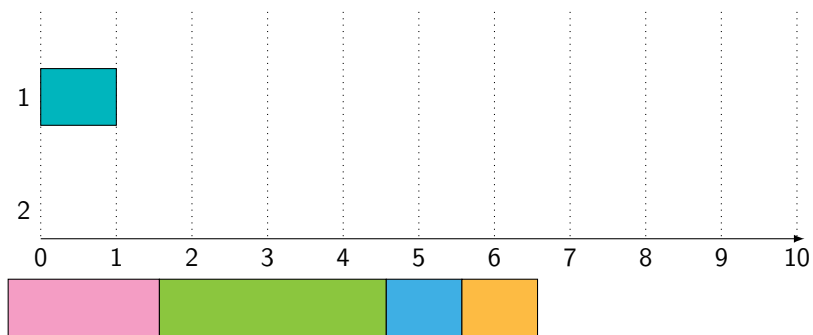
Reconfiguration



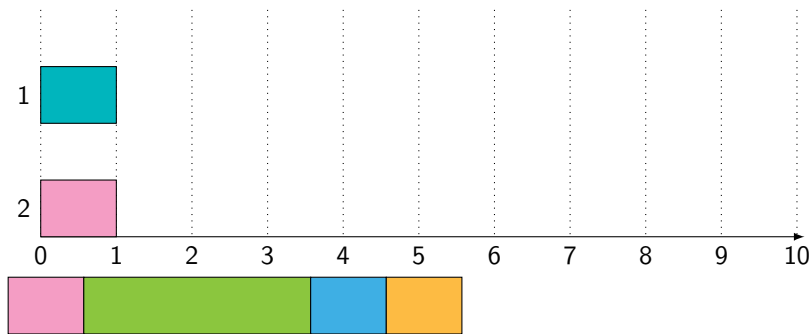
Protocol: run-time phase



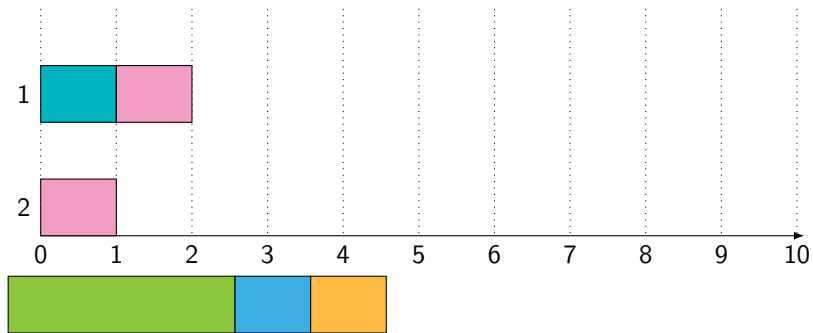
Protocol: run-time phase



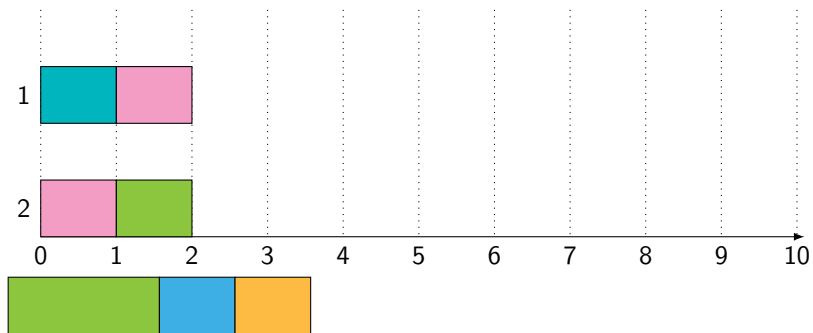
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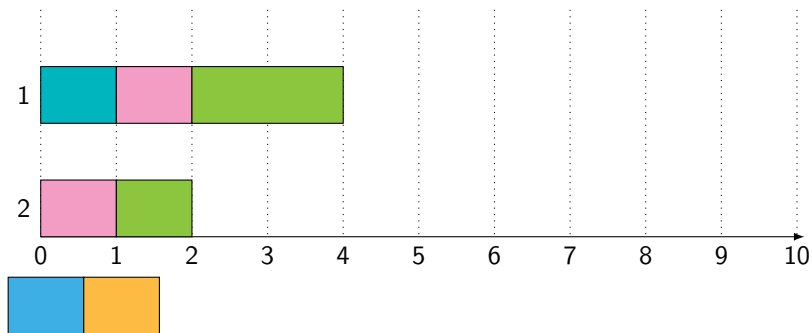
Protocol: run-time phase



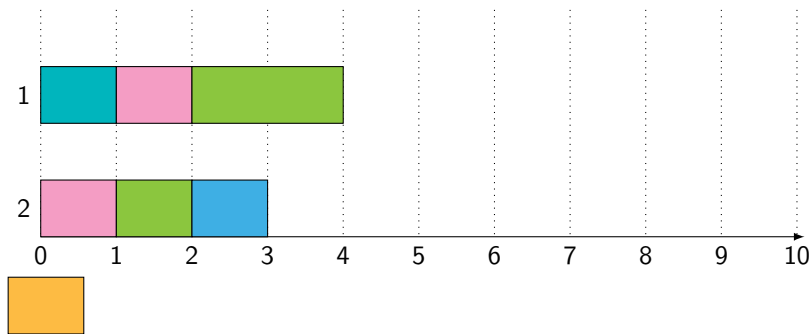
Protocol: run-time phase



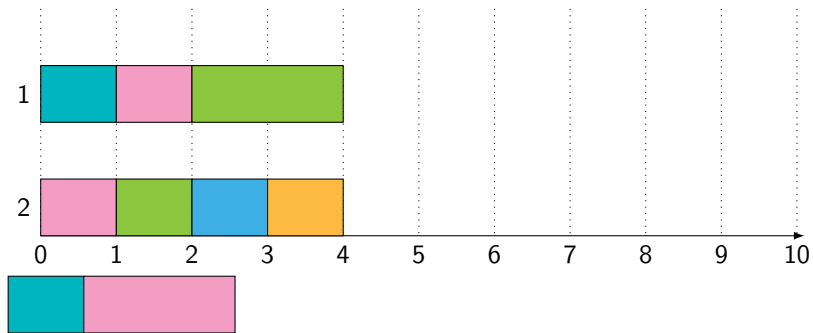
Protocol: run-time phase



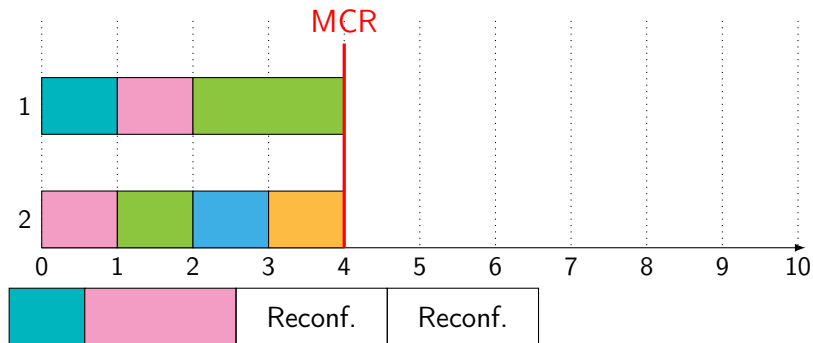
Protocol: run-time phase



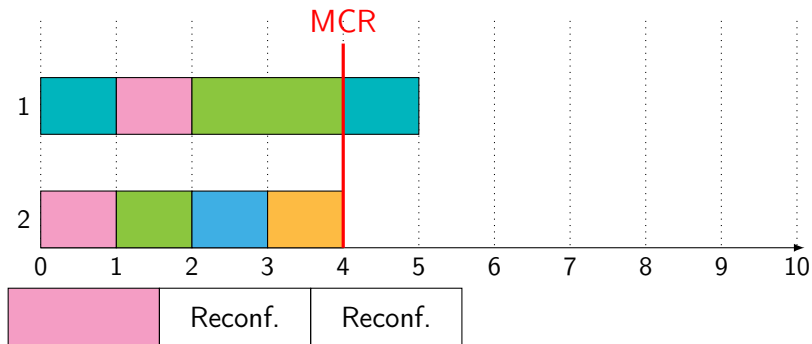
Protocol: run-time phase



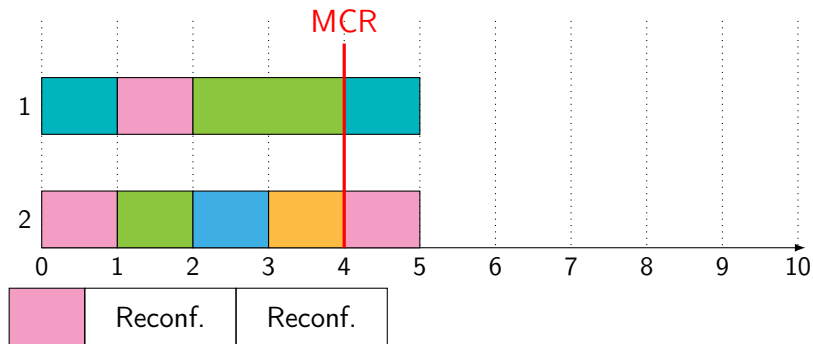
Protocol: run-time phase



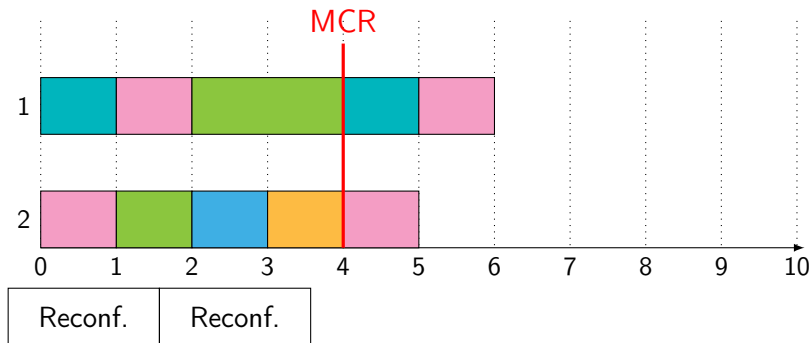
Protocol: run-time phase



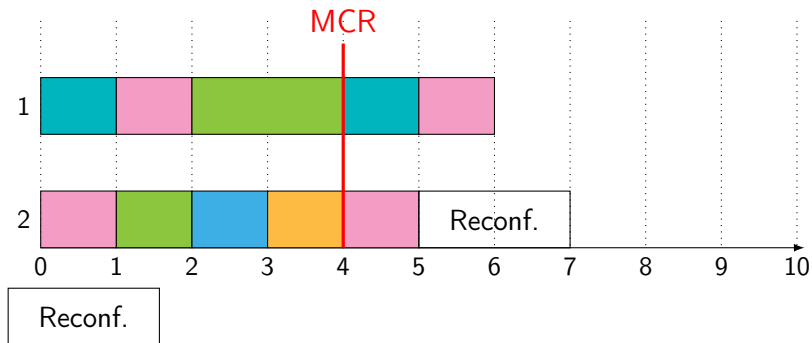
Protocol: run-time phase



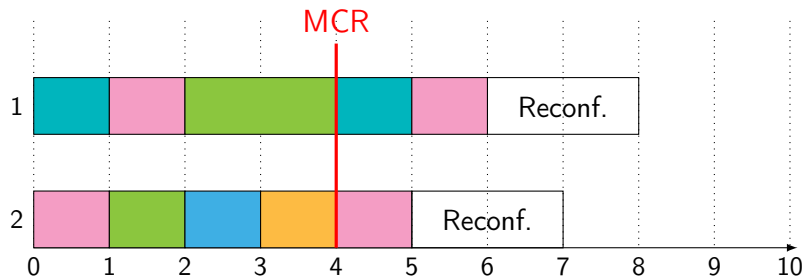
Protocol: run-time phase



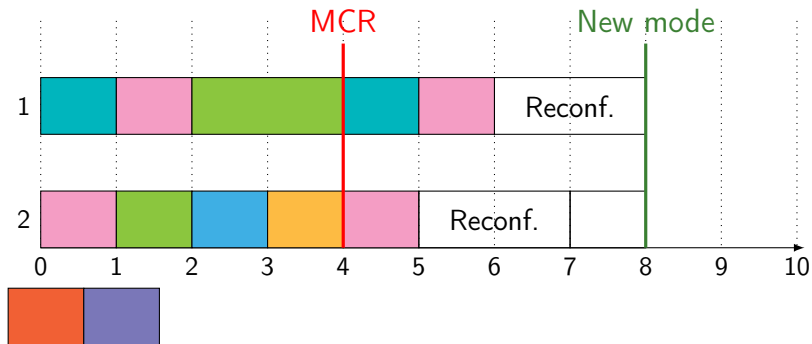
Protocol: run-time phase



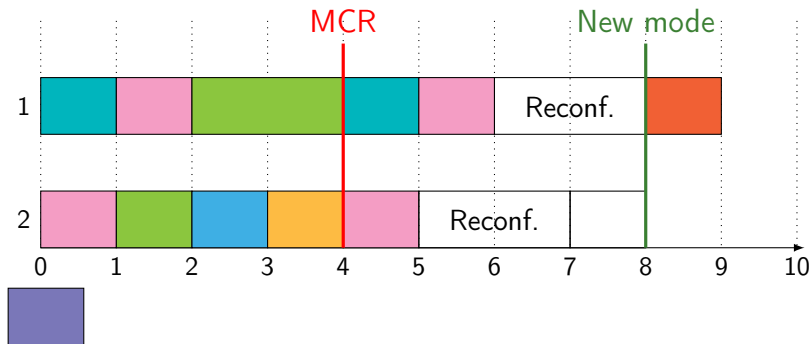
Protocol: run-time phase



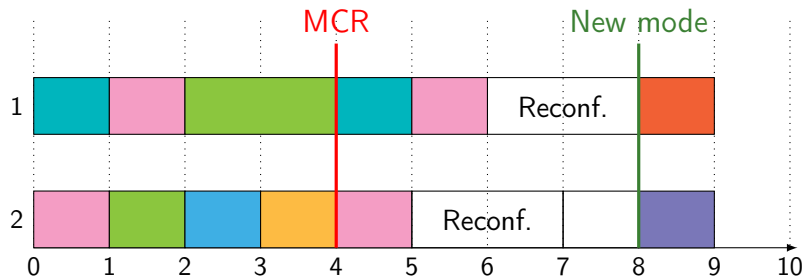
Protocol: run-time phase



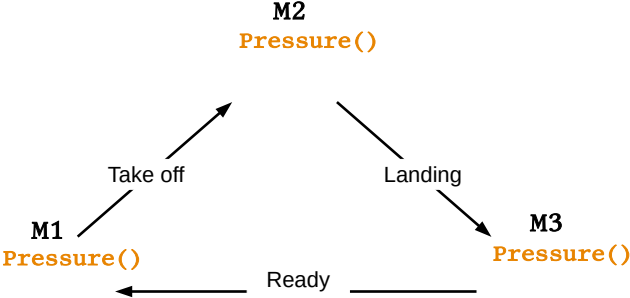
Protocol: run-time phase



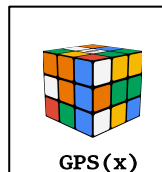
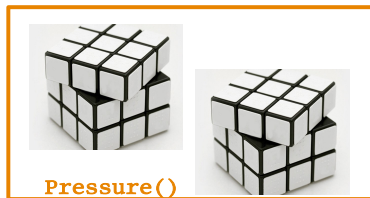
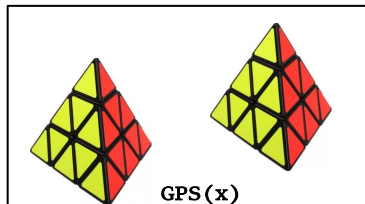
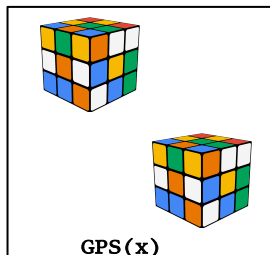
Protocol: run-time phase



Mode-independent tasks: problem?



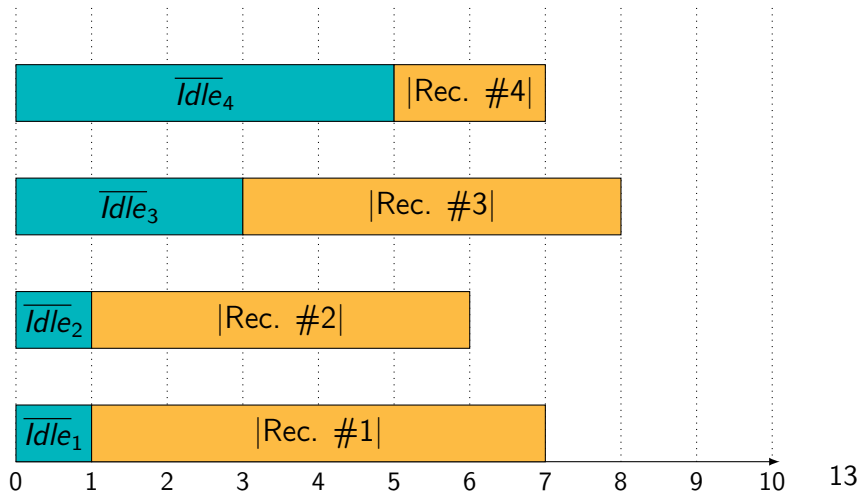
Mode-independent tasks: problem?



Feasibility

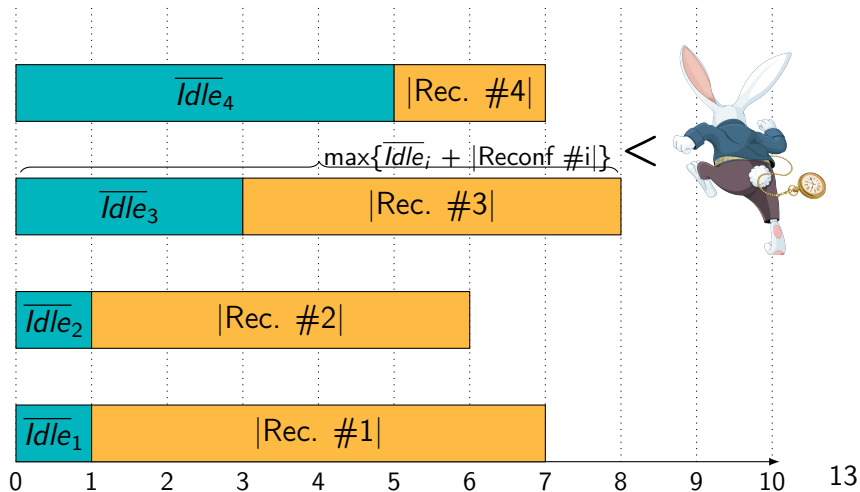
Reconfigured

From M^i to M^j



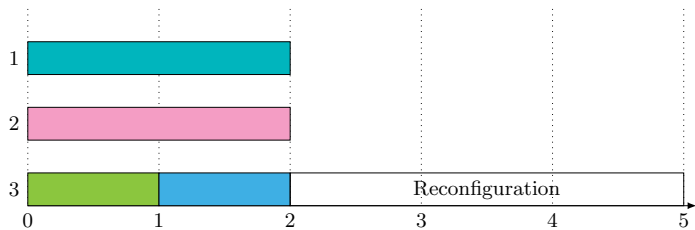
Reconfigured

From M^i to M^j

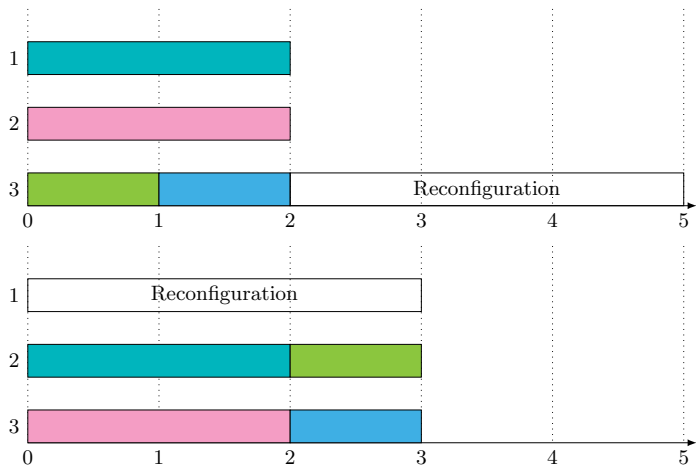


Performance analysis

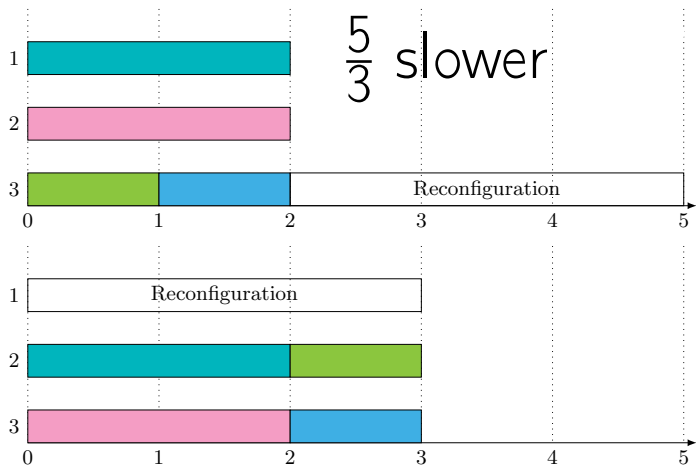
A competitive analysis



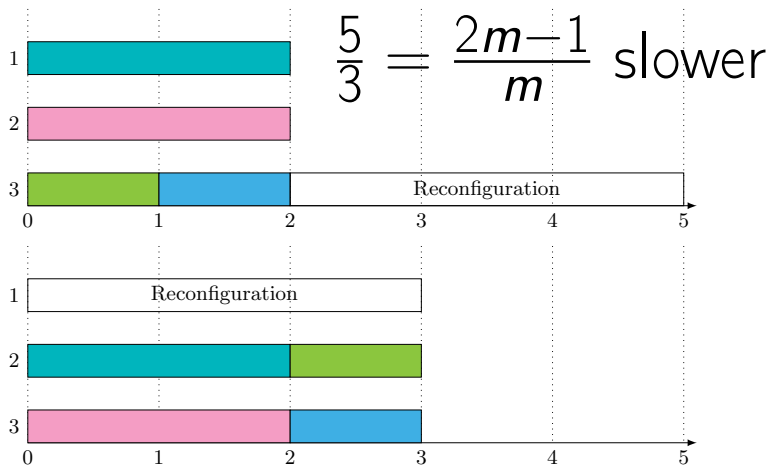
A competitive analysis



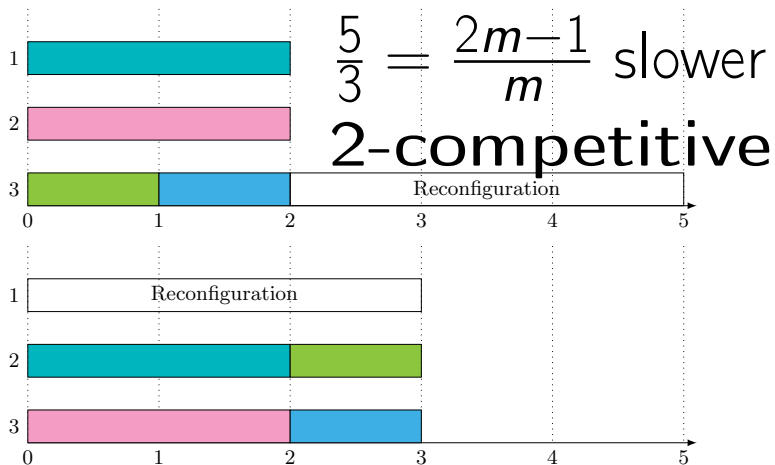
A competitive analysis



A competitive analysis



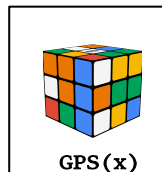
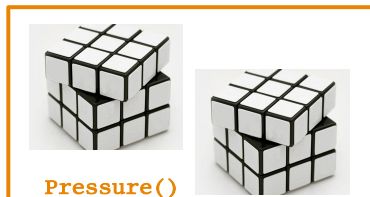
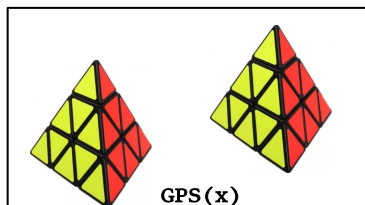
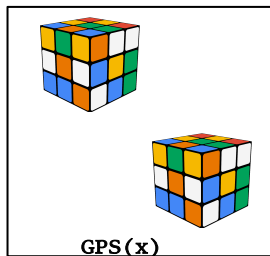
A competitive analysis



Future work

Future work

- Mode-independent tasks



Future work

- Mode-independent tasks
- Performances



Conclusion

