
Rationale behind a layer model for QC

why do we need that?



Delft Circuits

Hardware for quantum engineers

Rob F.M. van den Brink
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Why a layer model?

To enable Modularity

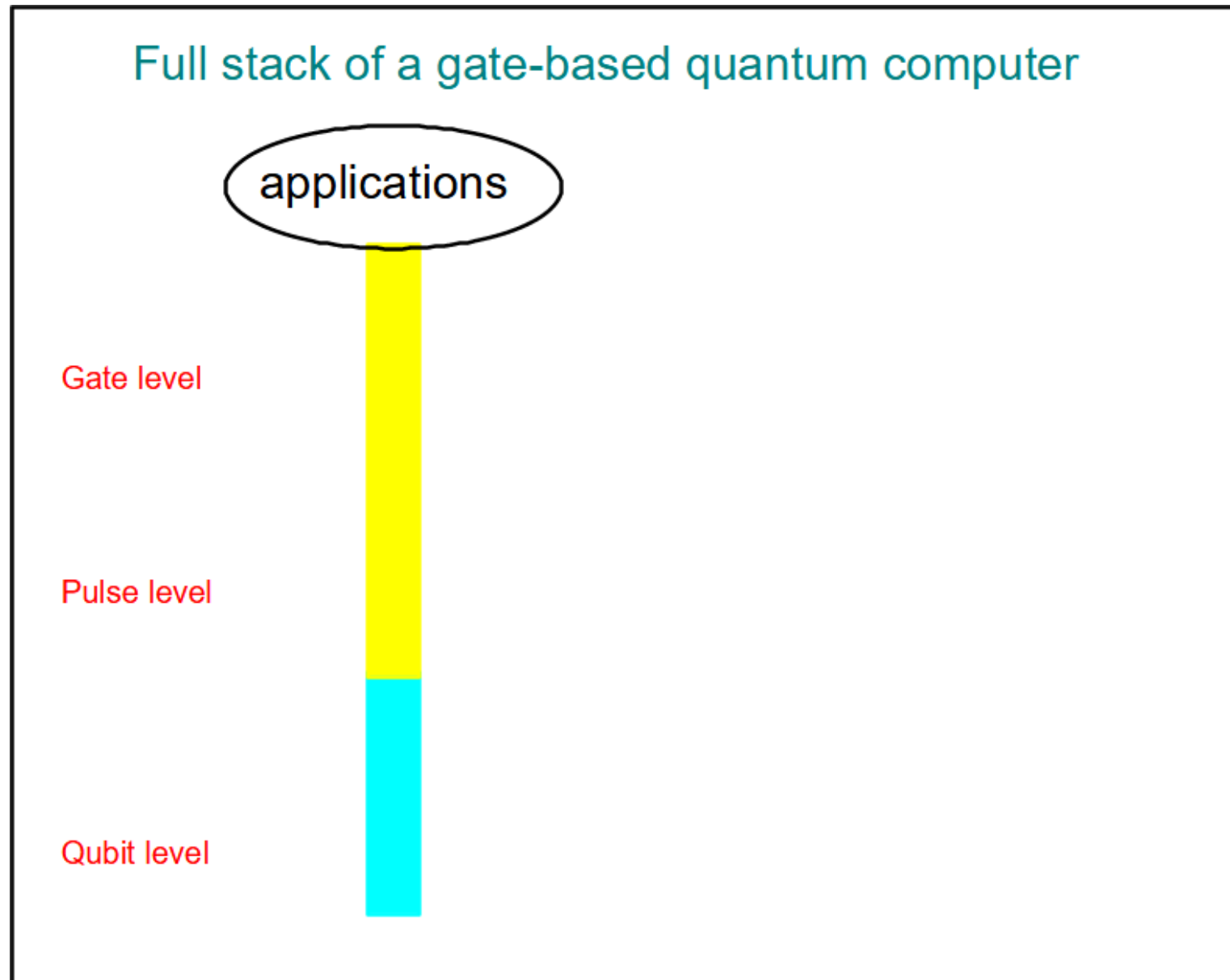
- Customers can combine product from different vendors
- Customers can upgrade by exchanging hardware/software modules
- Vendors will increase sales due to a global market
- Innovation is stimulated since the best modules can be selected
- No customer lock-in to a single monolithic solution

What is needed for that?

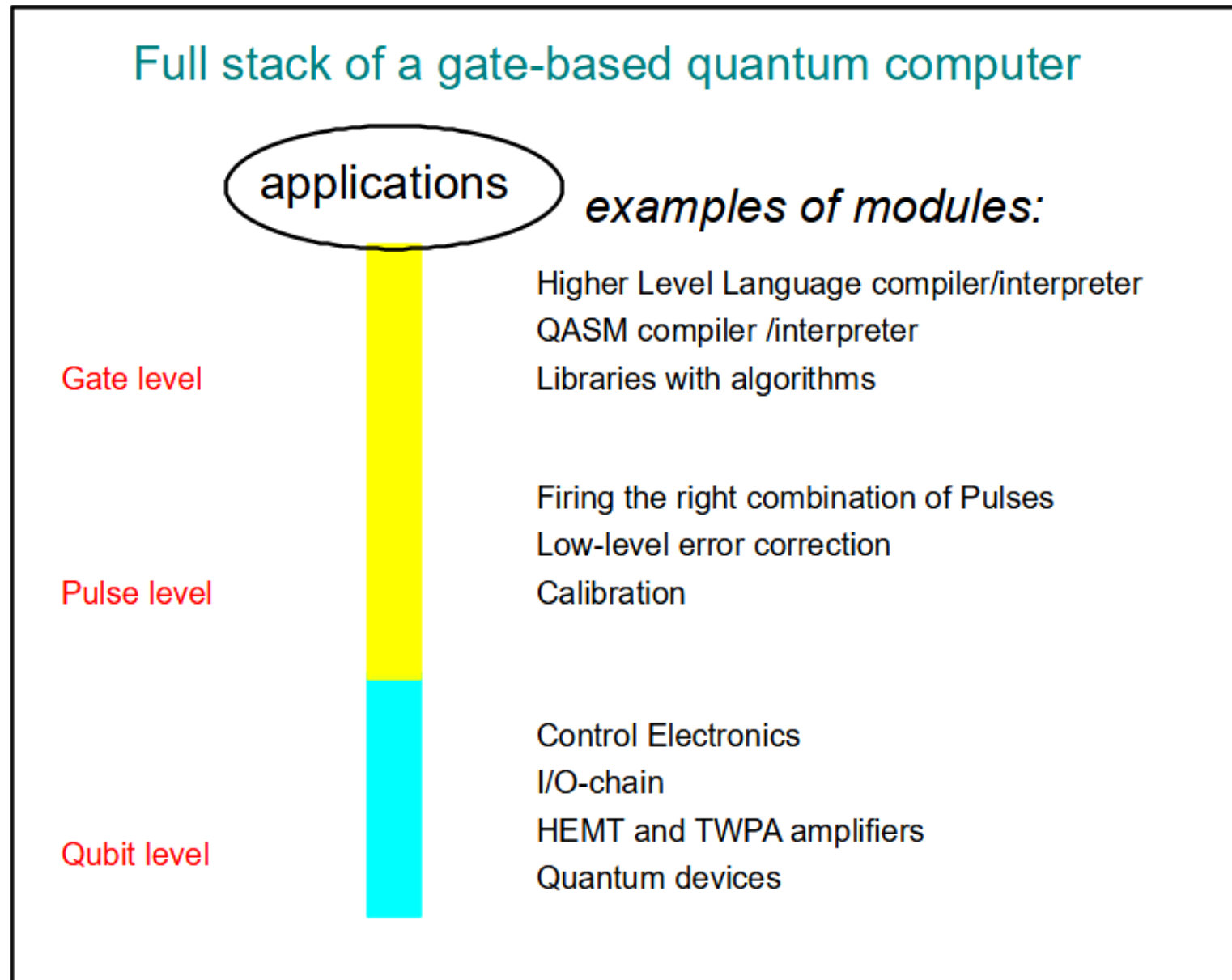
- Modules that can interwork with each other
- Interfaces between those modules that are compatible
- Layer model, to identify interfaces and functionality of modules



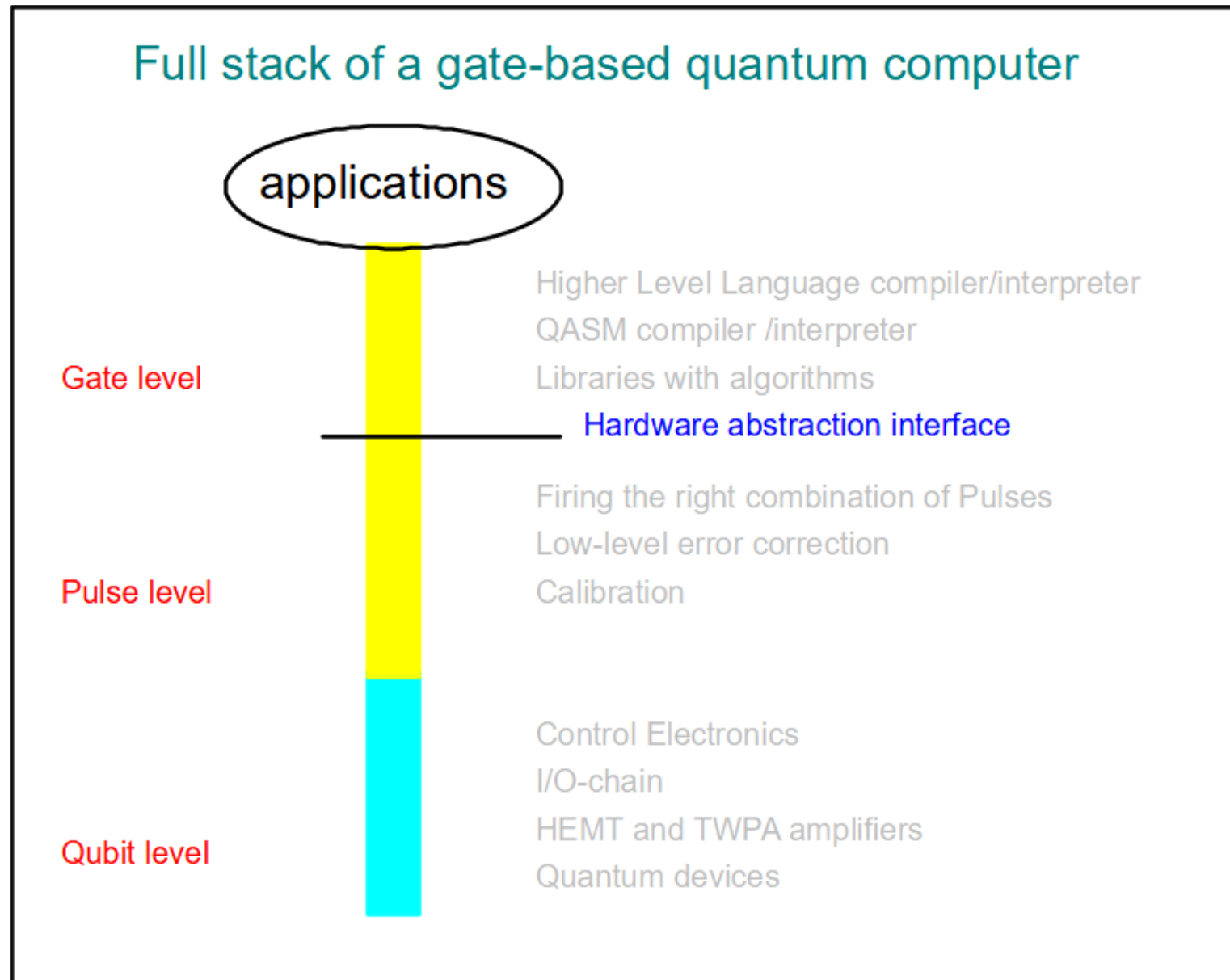
Example: gate-based quantum computers



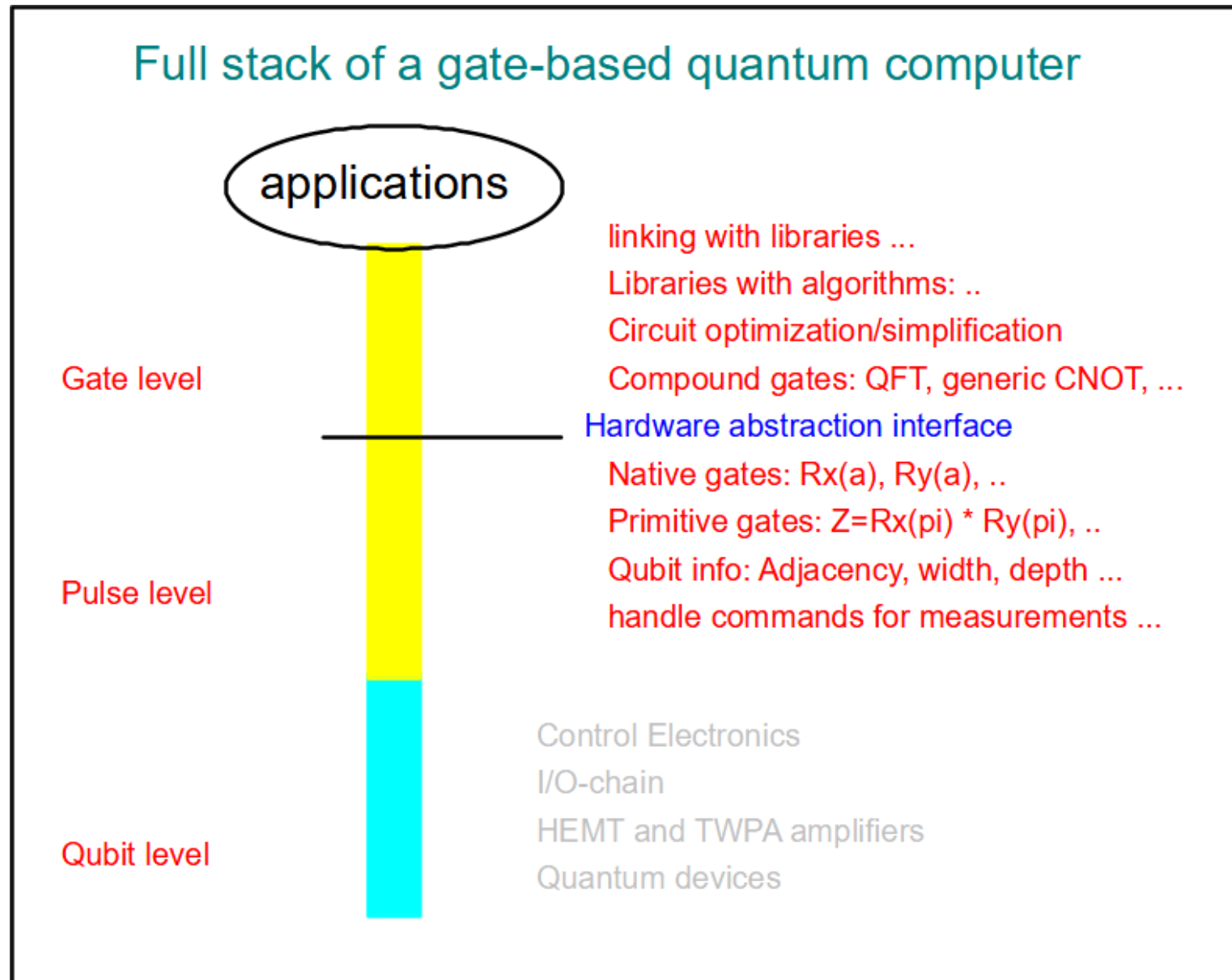
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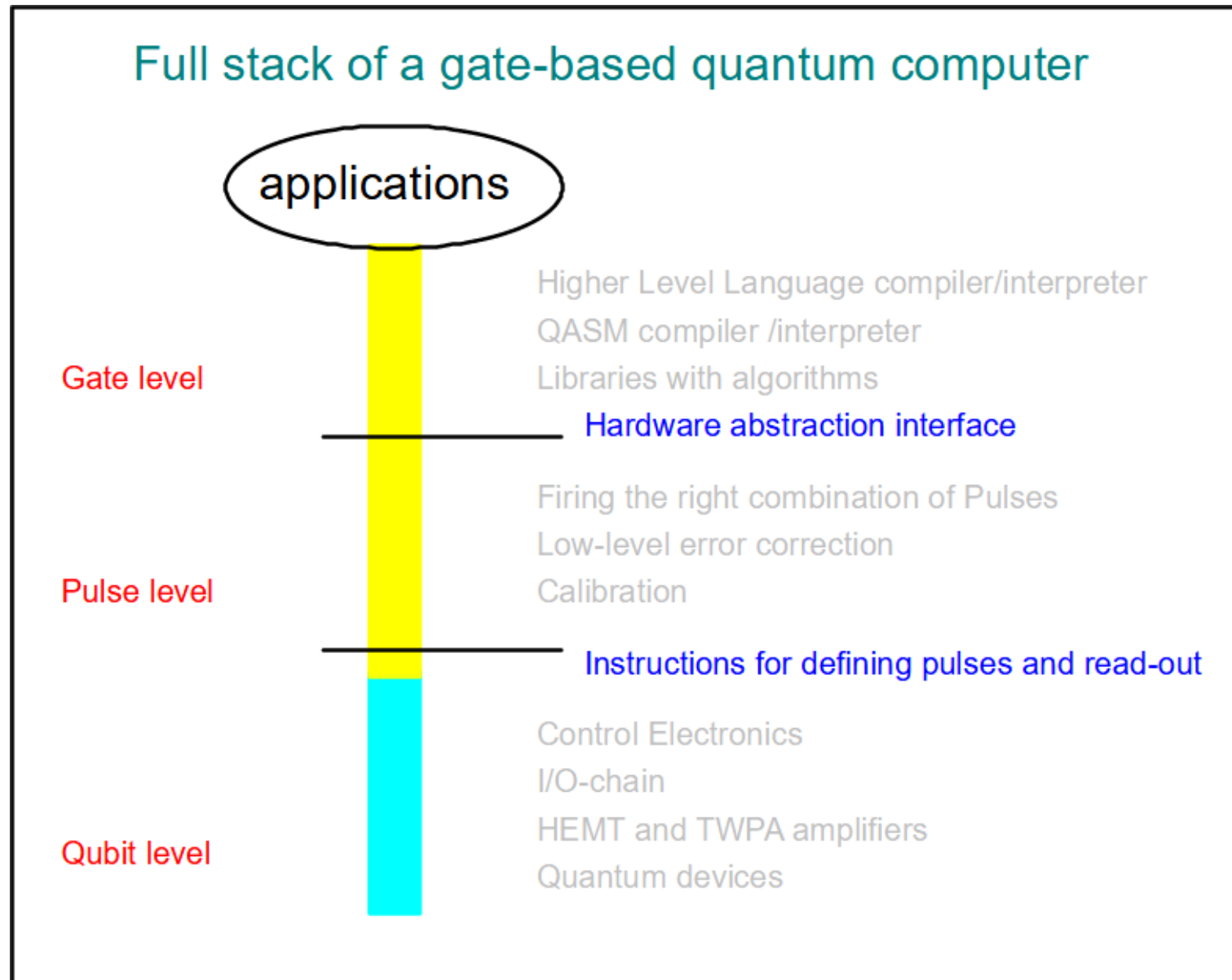
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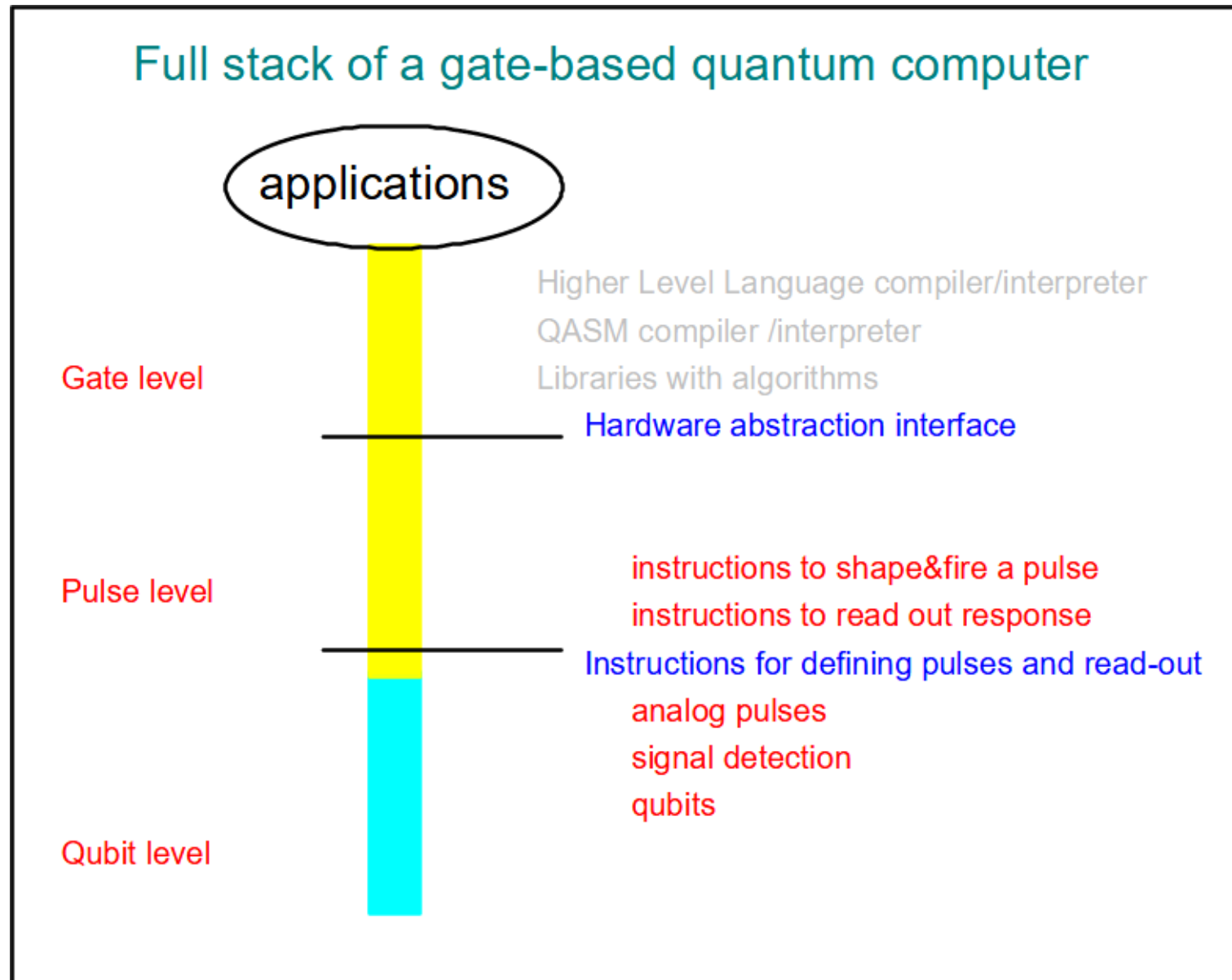
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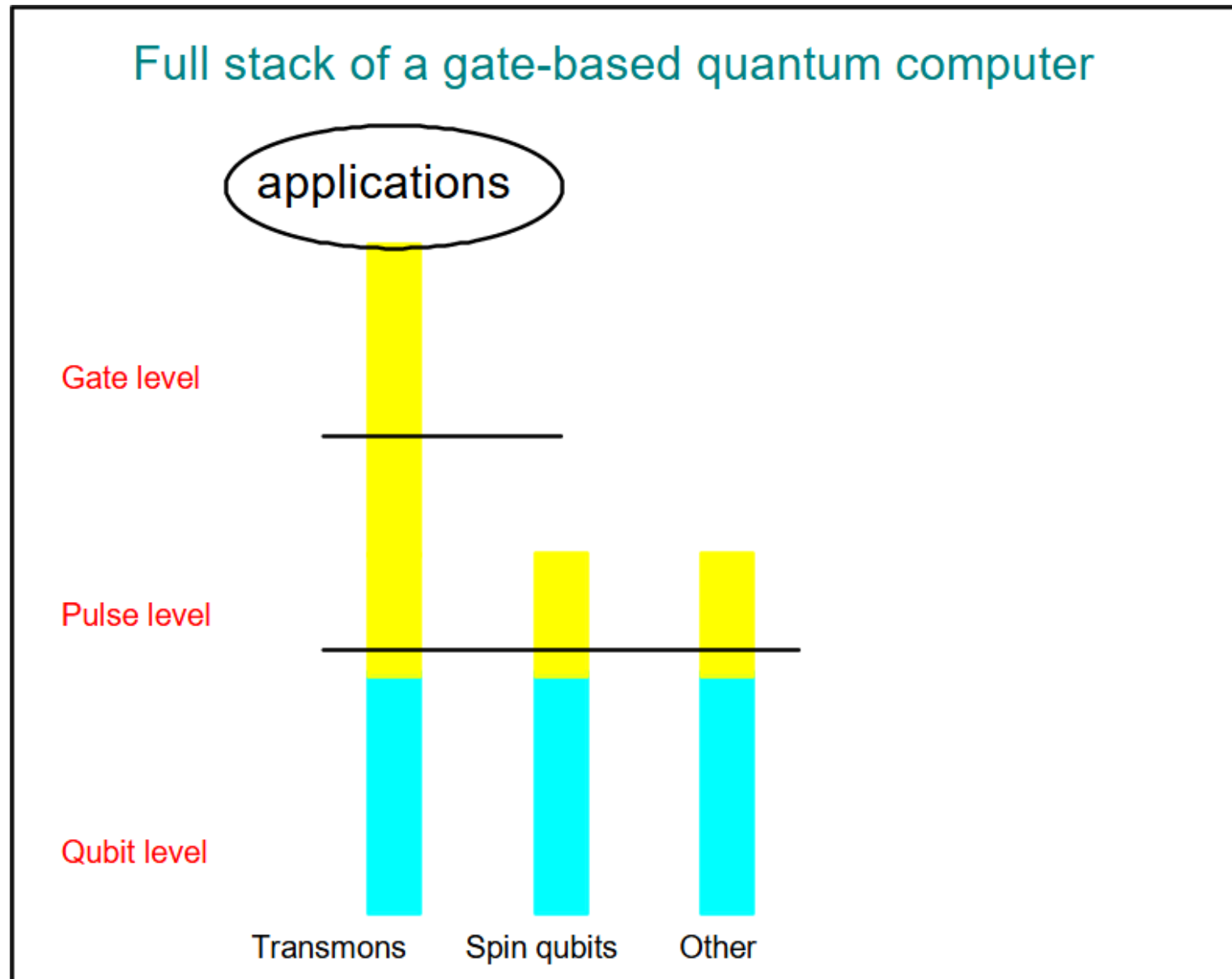
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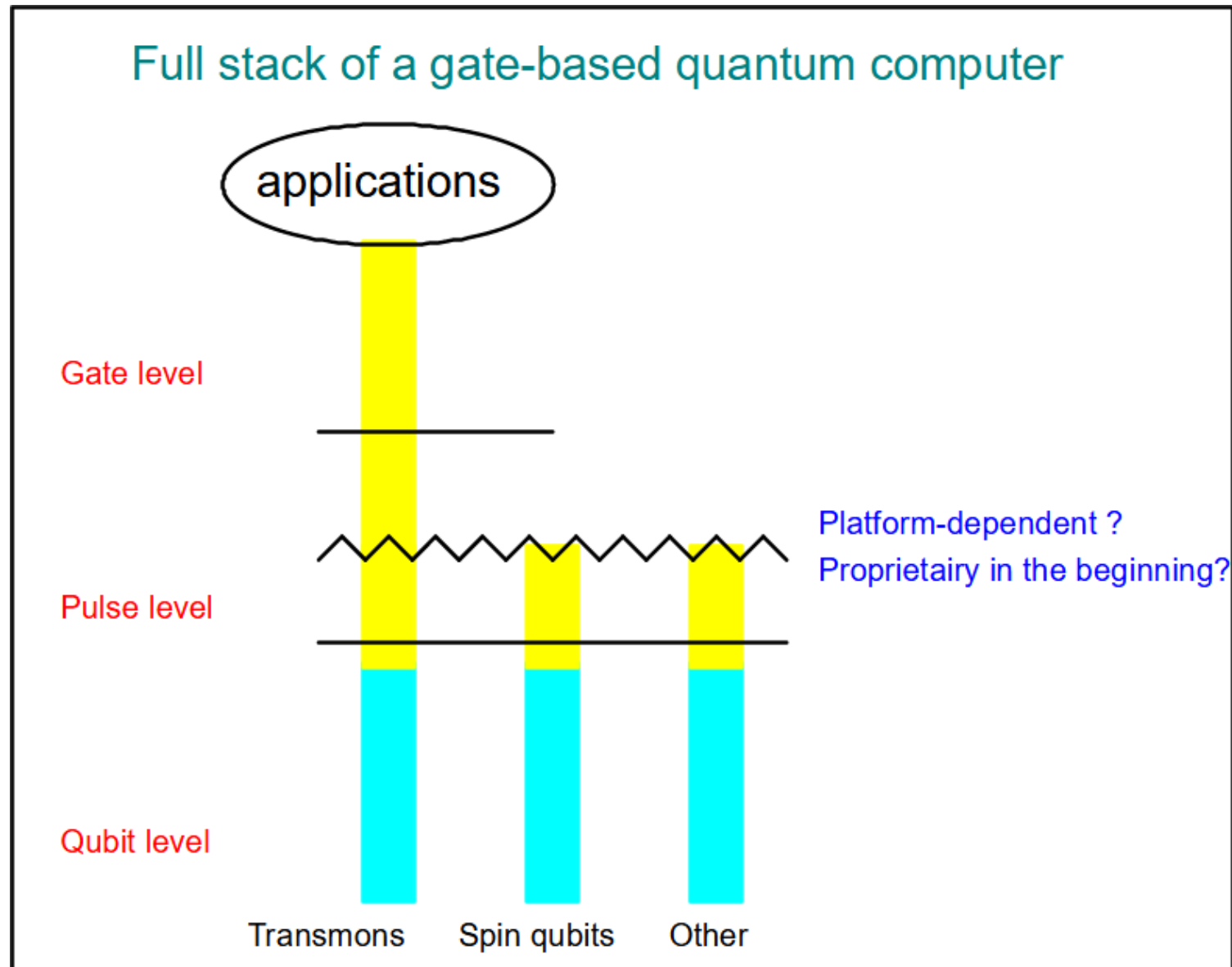
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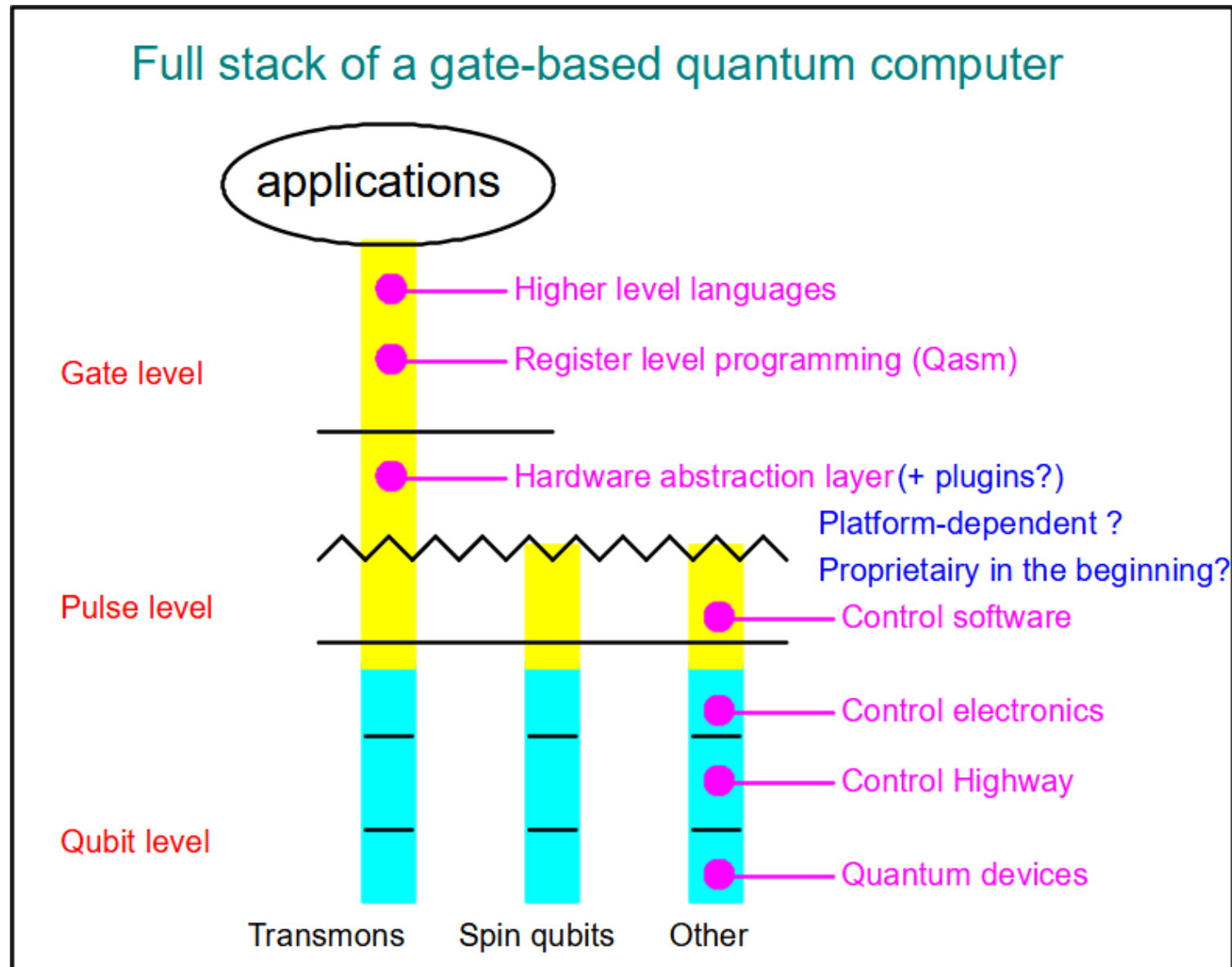
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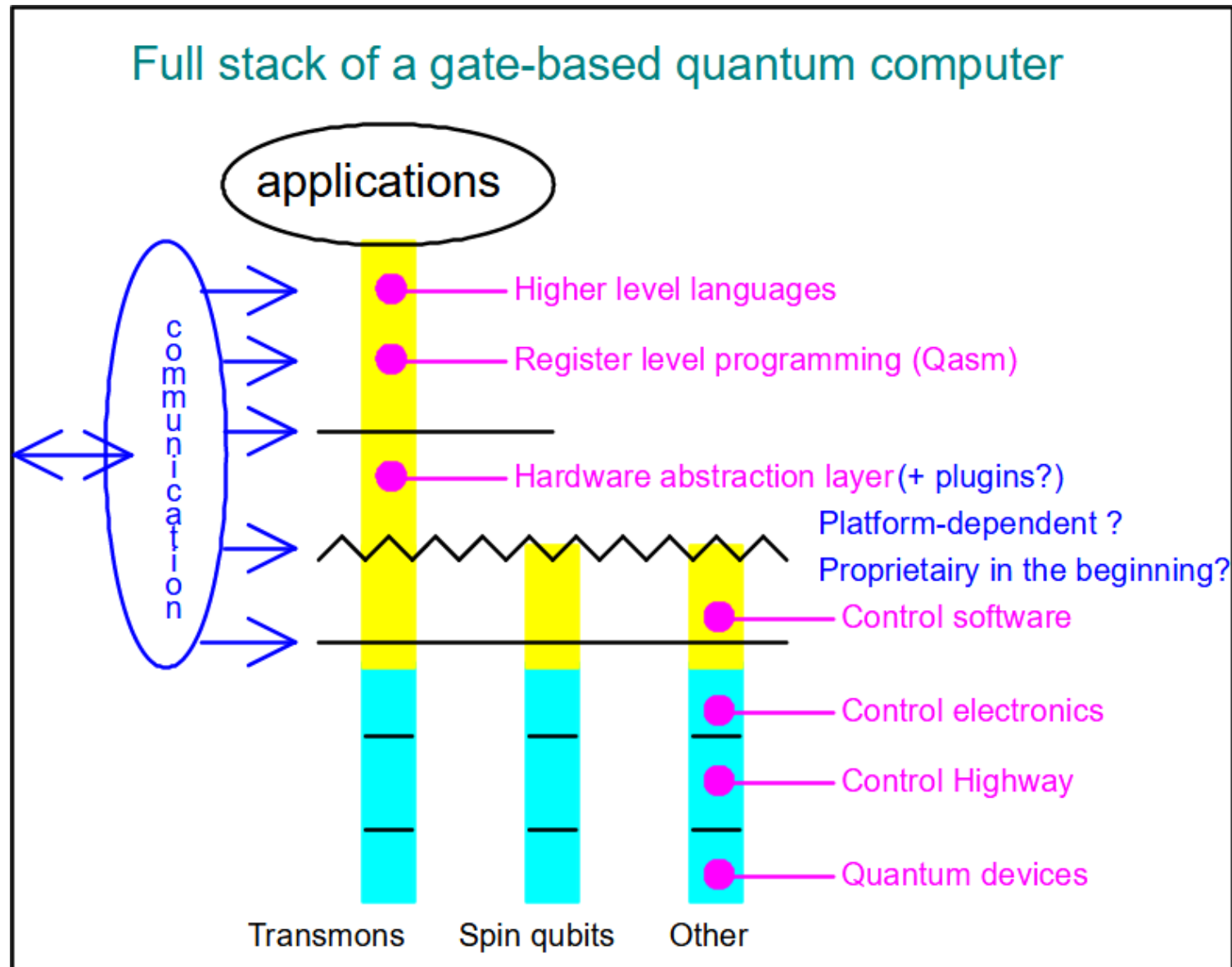
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Considerations / discussion

If no consensus on modularity as goal

- No real need for layer model
- Mainly monolithic solutions + vendor lock-in
- Limited value for standardisation

If no consensus on at least those three interfaces

- Modularity not feasible

If no consensus on functionality of individual modules

- Modularity not feasible



