

P2S2 Panel: Is Hybrid Programming a Bad Idea Whose Time Has Come?



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Challenges in realizing hybrid models

- **Mixing high-level and low-level models is complex, machines are getting more and more complex..**
- **Sharing data structures between models can sometimes mean unnecessary data copies.**
- **Dealing with hybridization of low-level and high-level models is complex, resolving issues here will only be to find out that increasing hardware complexities are yet to be dealt with:**
 - **Although MPI was not conceived to work at this level, most application developers write MPI code (low-level model)**
- **Increasing the complexity of a model doesn't always balance out the increase in complexity of systems.**

Challenges in supporting it

- **Debugging for errors in homogeneous apps is very difficult at petascale today, it will be extremely challenging in the future**
- **Performance debugging will be a nightmare**
- **Good idea, but not when exposed to scientific application**

Summary

- **Hybrid programming could be an unnecessary complexity, alternatives: general or domain specific abstractions**
 - **Using an inter-node model combined with intra-node model is already prevalent (e.g. MPI+OpenMP) – no objections to that**