Study Committee C4

C4 POWER SYSTEM TECHNICAL PERFORMANCE

Paper ID_2022_11014

Large network EMT modelling using cloud computing, including batch.
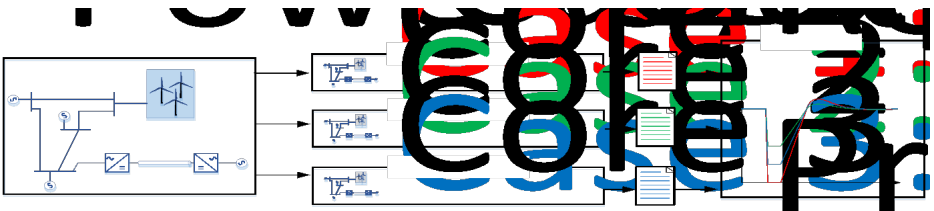
G.N. Love* and P. Hofbauer**
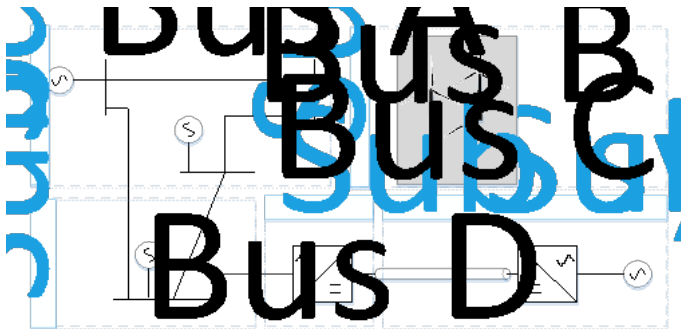
*PSC IRL and **SSEN UK

Motivation

- Shared Experiences of EMT Modelling using Cloud computing
- Demonstrate use of Batching for mass-parallel simulation.

Case Parrallelism

Model Parrallelism

Core Number	Simulation Time m:s)	Speed increase (%)
1	5:13	100%
2	2:59	175%
4	1:50	284%

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Batch Process

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Costing

Capital cost of on-premises servers against equivalent cloud-based computers.
- Break-even point where it is cheaper to buy an on-premises computer.

Computer size	5% discount rate (yearly hours)	7% discount rate (yearly hours)
64 core (standard rate)	705	744
64 core (low-priority)	947	1000
16 core (standard rate)	839	886
16 core (low-priority)	1127	1190

Conclusions

In this paper, both case and model parallelism EMT simulations were described.

- A method of cloud computing to undertake parallel EMT simulations were discussed using a cloud provider's batching service

- Batching is simple and can have cost advantages over a cloud-based cluster of VMs.