Battery simulation workflow and UI integration with ICE

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Background

The Computer Aided Engineering for Batteries (CAEBAT) research initiative has developed a scalable multi-physics battery model based on the Open Architecture Software (OAS) framework. The Virtual Integrated Battery Environment (VIBE) couples thermal, electrical, and electrochemical components in order to provide an integrated model for battery performance and safety.

New tools in ICE have been developed to provide VIBE users a seamless workflow and data management environment. These tools span the processes of input generation, job launching, data transfer, and analysis/visualization.

VIBE's Architecture

VIBE consists of four components. OAS provides software infrastructure, BatML is a specification for defining battery information, the Battery State controls coupling between simulation components, and ICE provides a graphical interface for managing the simulation workflow.

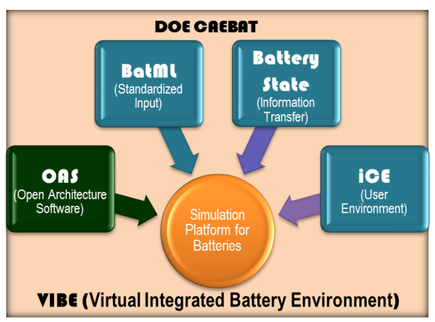
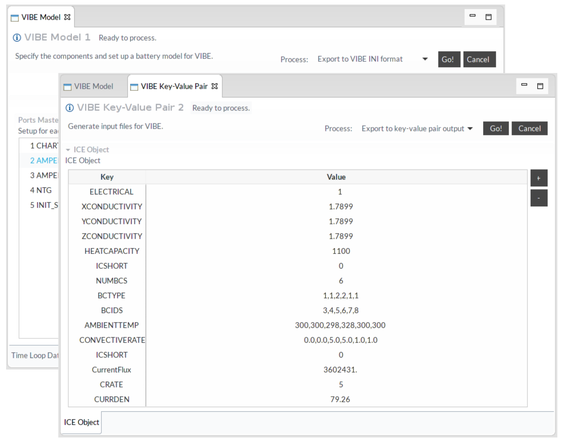
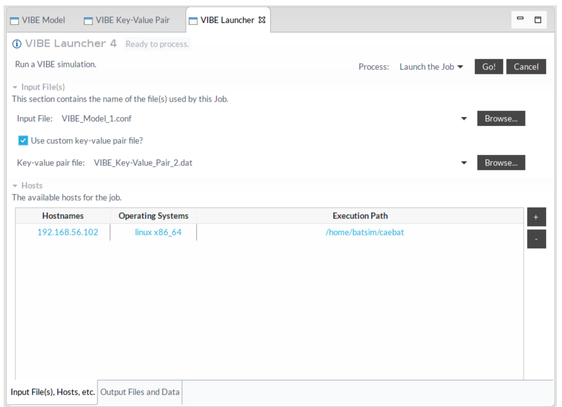


Figure 1: A schematic of the Virtual Integrated Battery Environment (VIBE)

Model

Generate input files specifying components and physical properties with the VIBE Model and VIBE KV Pair items.



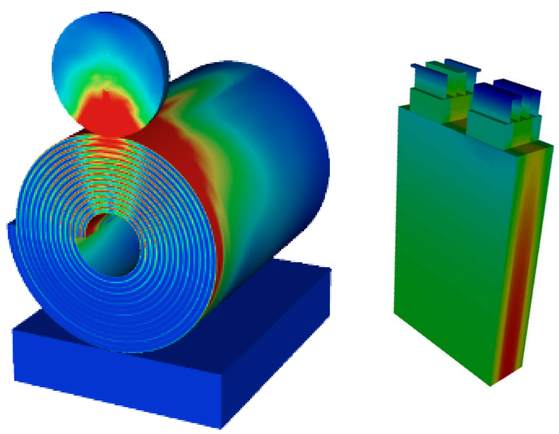


Launch

Run your simulation locally or remotely with the VIBE Job Launcher.

Visualize

Use the Resources view to manage and analyze your output data.



Further Information

A virtual machine with all of the necessary software to get started can be downloaded from batterysim.org. Scan the QR code below to go there now:

A guide to setting up remote job launching for virtual machines can be found in the ICE wiki pages. Scan the QR code below to go there now:

References

[1] ICE Documentation

[2] CAEBAT OAS Release Document

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[n] Etc

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