

## **Multi-Physics Coupling and the Nevada FEM Software Framework**

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This talk will introduce the Nevada/Alegra FEM framework under development at Sandia National Laboratories. Nevada is a software backbone supporting the integration of physics applications for more rapid development and lower maintenance overhead. Alegra is a set of coupled physics modules with high code reuse built on top of the Nevada framework.

The services that the Nevada framework supplies include unstructured and structured mesh topologies with field variable storage, parallel communication structures, dynamic adaptivity and load balancing, extensive material libraries, a number of available input/output formats, and advection on structured and unstructured topologies.

We will describe the design and approach to the various services and examine the coupling methods used to combine physics applications. Results will be given from a number of the applications together with some parallel scaling and performance metrics.

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