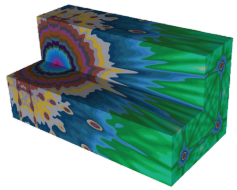


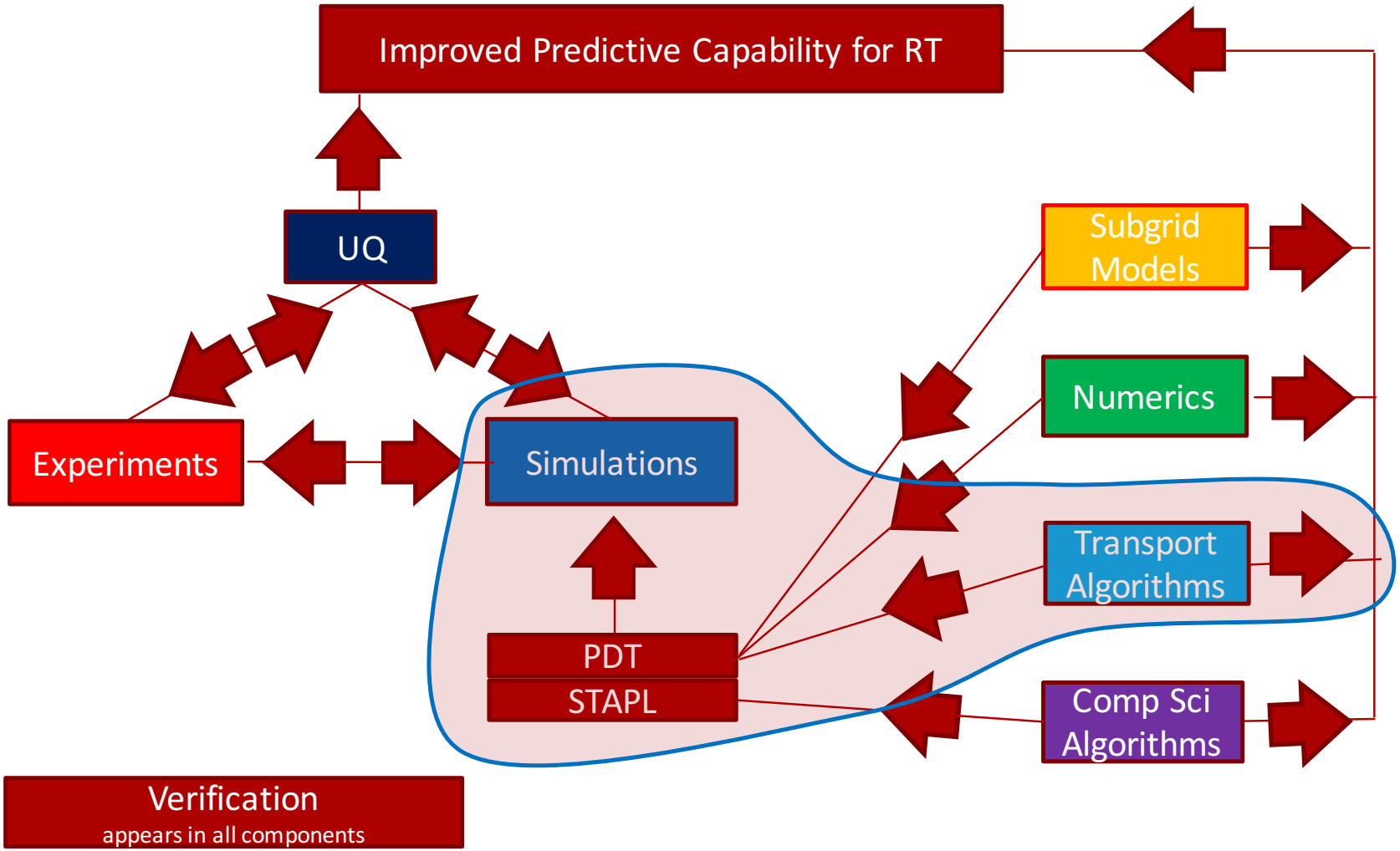
CERT

Center for Exascale Radiation Transport

CERT Presentation Template

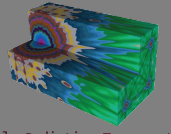
Texas A&M University

Project Components and Integration



1 Introduction

Motivation



When running any massively parallel code, load balancing is a priority in order to achieve the best possible parallel efficiency.

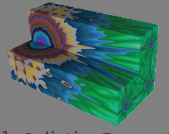
A load balanced problem has an equal number of degrees of freedom per processor.

Load balancing a logically Cartesian mesh is “not difficult", as the user specifies the number of cells being used.

In an unstructured mesh, the user cannot always specify the number of cells they want per processor, and obtaining a load balanced problem is more difficult.

The goal is to implement an improved load balancing algorithm for unstructured meshes in PDT.

PDT



All work presented in this thesis was implemented in Texas A&M's massively parallel deterministic transport code, PDT.

It is capable of multi-group simulations and employs discrete ordinates for angular discretization.

Features steady-state, time-dependent, criticality, and depletion simulations. It solves the transport equation for neutron, thermal, gamma, coupled neutron-gamma, electron, and coupled electron-photon radiation.

PDT has been shown to scale on logically Cartesian grids out to 1 million cores.

PDT now has an unstructured meshing capability, as a result of this thesis.