An Interactive Remote Visualization Environment for an Electromagnetic Scattering Simulation on a High Performance Computing System

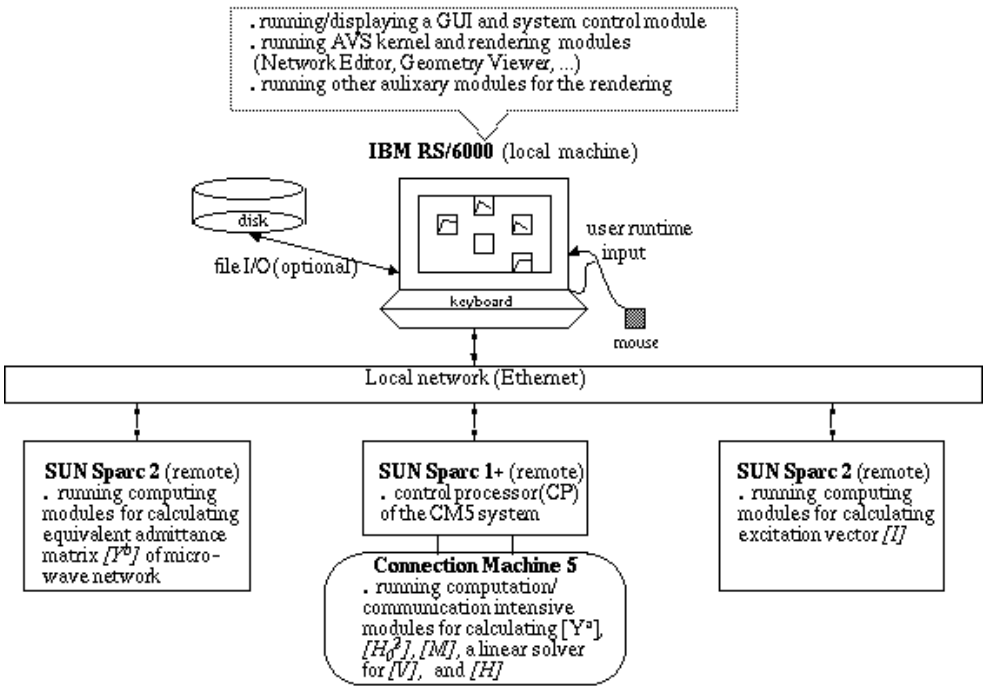
SUMMARY

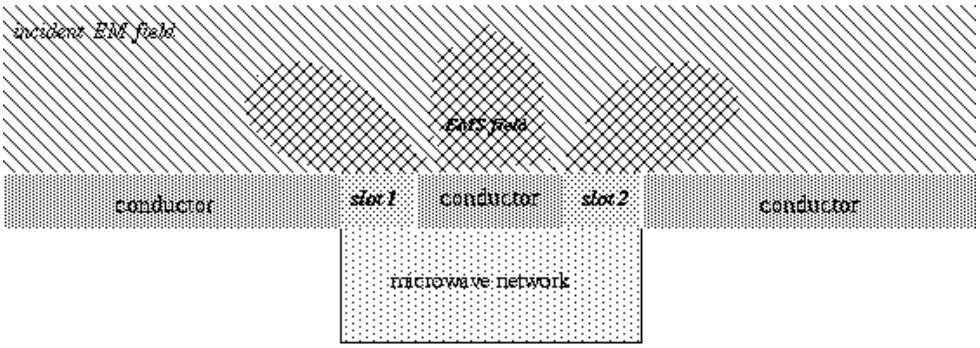
Electromagnetic scattering (EMS) simulation is an important computationally intensive application within the field of electromagnetics. Advances in high performance computing and communication (HPCC) and data visualization environments (DVE) provide new opportunities to visualize real−time simulation problems such as EMS that require significant computational resources.

In this work, an integrated interactive visualization environment was created for an EMS simulation, coupling a graphical user interface (GUI) for runtime simulation parameter input and 3D rendering output on a graphical workstation, with computational modules running on a parallel supercomputer and two workstations. Application Visualization System (AVS) was used as integrating software to facilitate both networking and scientific data visualization.

Using a simulation of electromagnetic scattering from a plane conducting two slots as a case study in this work, we explore the AVS data flow methodology to naturally integrate data visualization, parallel systems and heterogeneous computing. Major issues in integrating this remote visualization system are investigated, including task decomposition, system integration, concurrent control, and a high level DVE−based distributed programming model.

System Configuration





Electromagnetic Scattering From A Plane Conducting Two Slots

Northeast Parallel Architectures Center, Syracuse University, npac@npac.syr.edu