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Clustered Scientific Visualization using the ISIC Video Wall

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A clustered visualization application has been developed to allow scientists and policy makers to visually exploit large 4-D data sets. Data can be displayed and interacted with on large visual display systems, allowing for presentation/exploration of data to/with large groups of interested parties.

The advanced ISIC (International Space Innovation Centre) visualization suite located in Harwell, UK, is the home of an advanced videowall– one such large visual display system. The videowall consist of 28 wide screen panels that fit together to form a 7.2m x 2.3m display area. Each panel has its own processing PC, and is networked together using high speed Infineon technology, effectively turning the videowall into a 28 node cluster.

Exelis Visual Information Solutions, using its IDL (interactive data language) scripting language have developed a gallery application for displaying and interacting with 4-D data on the wall. The application can simultaneously display multiple data slices (where a data slice can be in the x/y, y/x or z/x orientation) along with profile plots, 3-D models and animations of the input data. The complete system is fully configurable across the videowall, allowing the user to create custom layouts of canvas's (a canvas would display a single image slice, profile plot etc). Canvas's can span multiple screens or multiple canvas's can fit onto single screens.

Data is accessed through shared directories across the high speed Infineon network. As each screen is driven by its own PC , only data relevant to that display is handled by that machine. The result is that data loading can be parallelized across the wall. So for example, if the application has been configured with 8 Canvas's, 8 data files can be simultaneously loaded. In instances where canvas's consist of multiple screens the visualization load is also distributed across the PC's that make up a canvas.