Video Presence Clustered Rendering and Remote Display Manager

Access Grid Retreat Presentation

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Part 1 - Video Presence Background

What is Video Presence ?

- A replacement for VIC on Access Grid Nodes.

The 2 Versions of VP

- c/c++/Python version : our release version.
- Java/c version : a version used to prototype new features.

What does VP offer ?

- VP's goals - streamline and simplify Access Grid Node operation.

How does VP achieve this ?

- Site Tiles
- Source Layout Managers
- Site Layout Managers

Site Tiles

- A grouping of all video Sources from a particular site.

- How are Site Tiles constructed ?

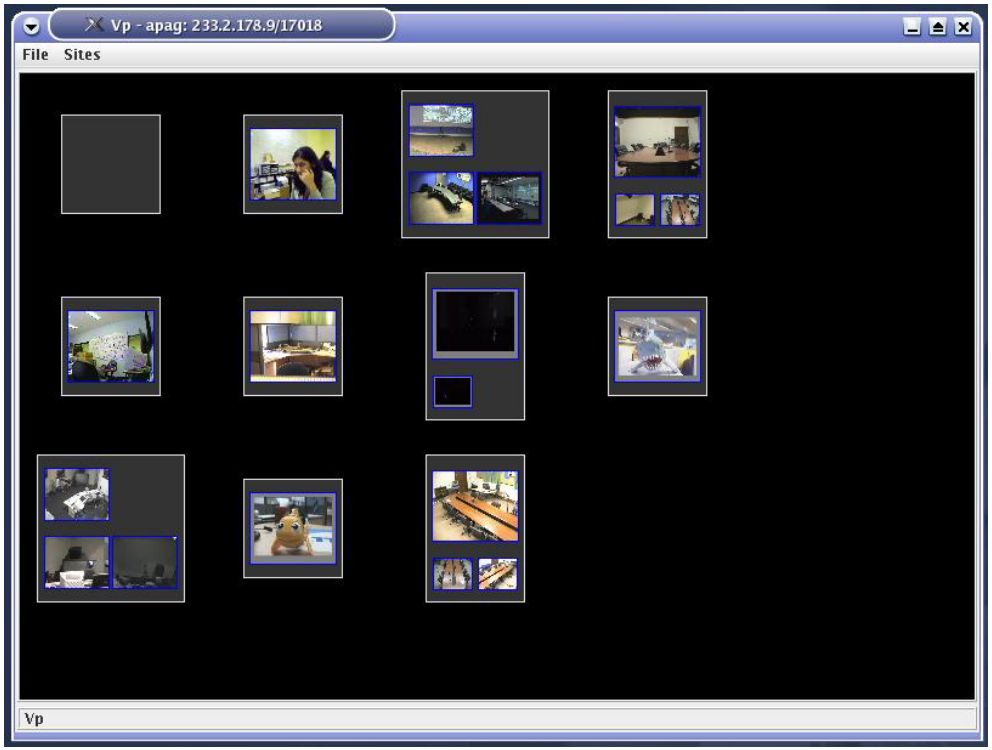
Source Layout Managers

- Display Source video feeds in a Site Tile according to different constraints.

- Grid and Priortised Layouts.

Site Layout Managers

- Control the initial placement of Site Tiles within the VP application window.



Part 2 - Clustered Rendering and Remote Display Manager

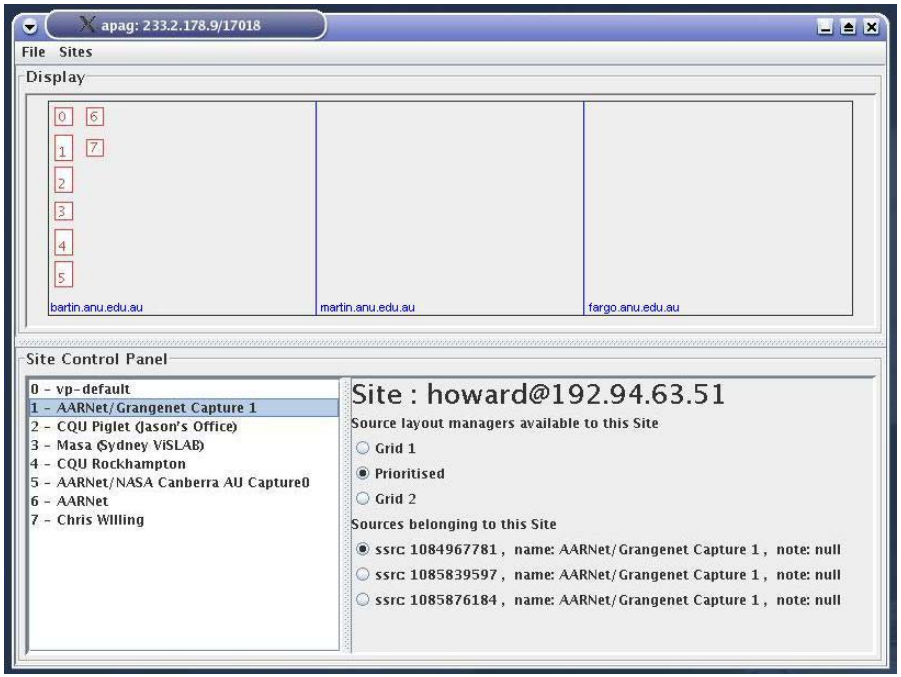
The need for a Remote Display Manager

- Several Access Grid Nodes are currently under construction at the ANU.
- Allows for the possibility of a single node operator to control VP on several nodes from a remote location.
- Necessary to control a VP display cluster.

Remote Display Manager

- 2D GUI application written in Swing (doesn't use OpenGL).

- Not a separate application but just another mode of VP.



3 Modes of VP

- Stand alone - used as a drop in for VIC on a PIG or single display PC Access Grid Node.
- Manager - used to control single or multiple clients.
- Client - used either as a single instance or part of a display cluster.

How VP uses a display cluster

- Start each of the client instances.
- Start the manager instance.
- Manager knows what multicast group to join.
- Manager then tells each of the clients what multicast group to join.
- Clients begin constructing Site Tiles.
- Manager then sends each client the information necessary to render its portion of the view.
- Manager processes and sends updates caused by user input.

How each client calculates its display

- Manager sends positions of clients in virtual world.
- Manager sends Site Tile information.
- How often to send this data ?

How does the display cluster increase performance ?

- Site Tile culling.

- Has advantages and disadvantages over single PC AG Node display.

Care must be taken to ensure the manager and each of the clients have a consistent view.

- What Site Tiles exist.
- Where they are placed.
- What Sources belong to each Site Tile.
- The ordering of Sources in a Site Tile.
- The render order of Site Tiles.
- What Source Layout Manager is used.

This is achieved using a combination of methods

- The manager informs clients of certain data.
- And of clients constructing their own views.

Client - Manager communication

- Uses multicast.
- Advantages
  Application as a whole is robust against a client (or even the manager) going down.
- Disadvantages
  Sometimes clients and the manager can have disagreeing views.
- Over time their views should agree but due to the infrequency of RTCP packets it can take a while.

Future work

- Finding this balance of what clients should do autonomously and what the manager (or other clients) should control will be part of any future development of the VP display cluster application.

- Port this functionality to the c/c++ VP.