

# Using Access Grid for distributed collaboration

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Access Grid is a collection of computational resources including multimedia large-format displays, presentation and interactive environments. Beside these resources, Access Grid enables access to grid middleware and applications and special visualization environments. Access Grid has all characteristics of a grid system: heterogeneous resources can dynamically join and leave the system; it has ability to create virtual organizations (called Venues) and it enables secure resource and application sharing.

Access Grid consists of two types of resources: nodes and PIG's. **Node** is a specially designed, room-sized installation that consists of multiple machines dedicated for quality display, video capture and streaming. Currently nodes are installed in 33 countries. Personal Interface to the Access Grid (**PIG**) is a single computer (e.g. desktop or laptop) containing all the services necessary for joining the Access Grid.

Video and audio streaming between resources is implemented with multicast-based tools. In order to provide secure communication between resources, Access Grid utilizes components of grid middleware system Globus Toolkit.

There are two central services in Access Grid: Venue Server and Bridge Server. **Venue Server** is service responsible for creating and managing Venues. Venue is a virtual space that binds a set of resources together. Venue Server provides resources with all the information needed to communicate with each other. Currently there are several Venue Servers in the world. **Bridge Server** is a unicast/multicast bridge. Bridge Server enables resources without multicast access to Access Grid.

Additional central service **AGSchedule** enables users to schedule events on Access Grid. By using AGSchedule, one can reserve Venue for special events (e.g. conferences, tutorials) or simply schedule a meeting for a specific group.

Multimedia functionalities of Access Grid system are group-to-group interaction (video, audio and text based), sharing applications (e.g. presentations, white board and shared movies) and data transfer. By focusing on group-to-group interaction, Access Grid differs from desktop-to-desktop tools that focus on individual communication. Beside for advanced collaboration, Access Grid can also be used for tutorials, lectures and conferences.

We tested several Access Grid configurations at University Computing Centre. In first configuration, we deployed a single node consisting of three computers. One computer was responsible for video capturing, second for audio capturing and third for handling display. In second configuration, we created full Access Grid testbed, consisting of initially created node, one PIG and Venue Server. In third configuration, we used a Bridge Server in order to join second PIG from a network without multicast.

We also utilized Access Grid in practice. We joined our resources to the Canadian WestGrid Venue in order to enable conferencing between participants from Canada, US, Germany and Croatia. Main motivation was enabling meetings of international conference International Symposium Computer Science in Sport (IACSS) steering committee. Afterward, we successfully used it for live streaming and remote participation on IACSS conference.