



Integrated Conferencing Platform™ (ICP)

Architectural Overview

Rev. 1.03

Whitepaper



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1. About the Arel ICP Platform

Arel's Integrated Conferencing Platform™ (ICP) is an advanced platform that combines the critical aspects of verbal and visual communication — video and two-way audio — with rich content, collaboration, discussion groups, application sharing and live interaction. The communications platform reaches and connects large numbers of people in real-time through any combination of satellite, video conferencing and internet/intranet networks.

Arel's universal conferencing enterprise software solution is an integrated suite of applications for interactive voice, video and data web communication that changes the way people work by providing them with enhanced communication tools. These tools make meetings more effective and facilitate collaboration for key business processes such as **corporate and marketing communications**, **distance learning**, product development, customer relationship management, and supply chain management. Using Arel Spotlight applications, geographically dispersed users can work together in groups, attend webinars and panel discussions, participate in training courses, and have one-on-one meetings with customers or colleagues, from virtually anywhere using desktop systems, laptops, keypads or even handheld wireless devices via Internet, Intranet or PSTN connections.

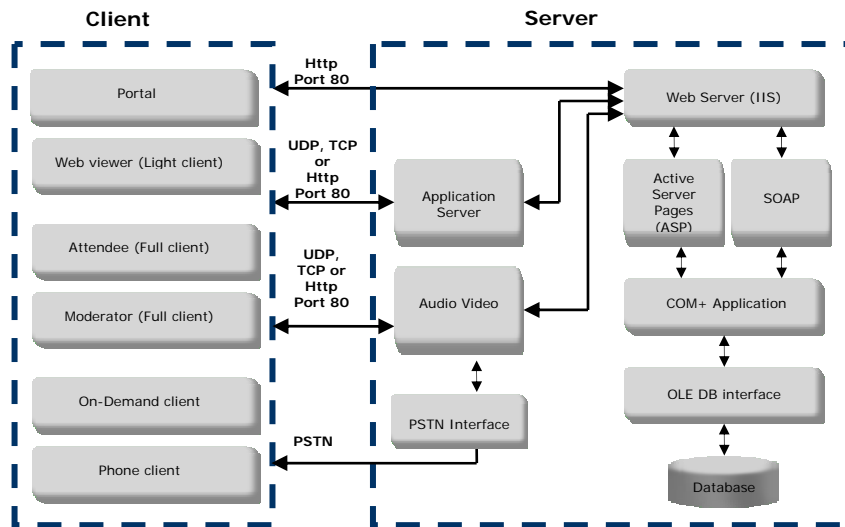
2. System Components and Architecture

Arel Spotlight™ is a suite of client-servers and real-time applications, architected for scalability, reliability and performance, while optimizing the use of bandwidth. The applications are based on Microsoft .NET technologies and use components written in C++.

Arel Spotlight™ offers the following architectural features:

- Web-based, client-server and real-time application
- 3-tier distributed server architecture
- Highly scalable and reliable
- Proxy server and firewall friendly
- Multiple bandwidth support
- Designed for rich media and video-enabled delivery
- Multiple network configurations – satellite, video conferencing and terrestrial Internet/Intranet
- Hybrid solution of multiple end-user units such as interactive response units (keypads), PCs and PDAs used simultaneously

3. Server Architecture



Architecture Overview

3.1. Arel's Distributed Application server (ADS)

Arel's Distributed Application server handles all of the interactions and communications for the Arel suite. The two major functionalities of the ADS include data interaction and signaling that can either run over the same server or be separated to work in a distributed environment. The Application Server is based on multiple-server architecture so that the system can scale up as needs grow and at the same time optimize bandwidth use. The Application Server supports UDP (multicast), TCP, HTTP and Arel's UltraStack™ protocols (a proprietary technology) for communication with clients.

ADS tasks include:

- Messaging between clients, such as sending a "raise hand" signal, activating the microphone and sending responses to questions and tests
- Collaboration functionality including distribution and management of application sharing, chat and whiteboard
- Audio and video distribution and conferencing
- Discussion groups

3.2. Audio/Video server (AVS)

The **Audio/Video Server** handles all audio and video interaction, conferencing and distribution, while providing services in multiple bandwidths as required. The audio/video server can support up to hundreds of concurrent users, based on the nature of the communications protocol, connection speed, CODEC and number of attendees or sessions.

3.3. Web server (IIS)

The **Web Server** serves content to live and on-demand participants and provides a *web services* interface to the database. Arel requires Microsoft Internet Information Server (IIS). The Web Server uses .NET technology to exchange data between the different clients, the different servers and the database.

3.4. Database and Management server

Arel's application suite is designed to work around a central database, providing out-of-the-box management functionality. Content authoring and assembly, learning management, scheduling, content management, an integrated portal and reporting/evaluation tools are all jointly designed, to create a fully integrated environment. The SQL-2000 server database provides a scalable and cost-effective solution.

Information managed by the database includes:

- Users administrative information
- Organizational structure and group management tools
- Site information and inventory management
- Sessions administrative data
- Content management (but not the content itself)
- Courses, lessons, tracks and scheduling
- Registration information (personal and by group)
- Records of all attendance and performance of participants
- Records of all logins and logouts
- Records of client type used
- Records of connection type used (PSTN or VoIP)
- System configuration and parameter information

Since the content is not stored in the database itself, the database is usually relatively small in size, with content located on web, file and media servers as described above.

The interface to the Management Server is through *web services* on the Web Server. Using the portal, users have access to information on live and recorded sessions using .NET pages. Other servers, like the Application Server or the Audio Video Server, approach the database primarily for initialization purposes using web services for information on connectivity and operation parameters.

3.5. NMS Server

Arel's Network Management System (NMS) enables on-line monitoring and automated maintenance of Arel's Interactive Distance Learning equipment. The NMS controls all Arel's components in the Training Center (studio) and at the dispersed Remote Sites connected via the communications server (ADS). Communication status from the installed modules is displayed on the NMS console for diagnostics and operation of remote maintenance functions.

The NMS is also used to perform software version upgrades remotely from the studio, to automatically shut-down and re-start Arel's Class Control Units (CCUs), and change configuration parameters without having to send technicians to the dispersed sites.

3.6. Media server (Optional)

In cases of streaming recorded video-enabled sessions, a **Media Server** is required, and the Microsoft Media Server (MMS) is used. The Media Server can be installed on the same machine or as a separate entity, based on number of concurrent users and performance criteria. Multiple-server configuration, with content update using unicast and/or multicast, is available.

3.7. PSTN gateway (Optional)

A PSTN gateway enables attendees to join sessions using telephone lines for various reasons. For example when a web connection isn't available or the connection's bandwidth is extremely low, it is possible for an attendee to dial into a meeting replacing the VoIP with a PSTN connection.

Arel's PSTN gateway functionality is based on the *Audiocodes TP-260 PCI VoIP* communication board. The board can either be installed in Arel's AVS video server or in a standalone PSTN gateway server.