

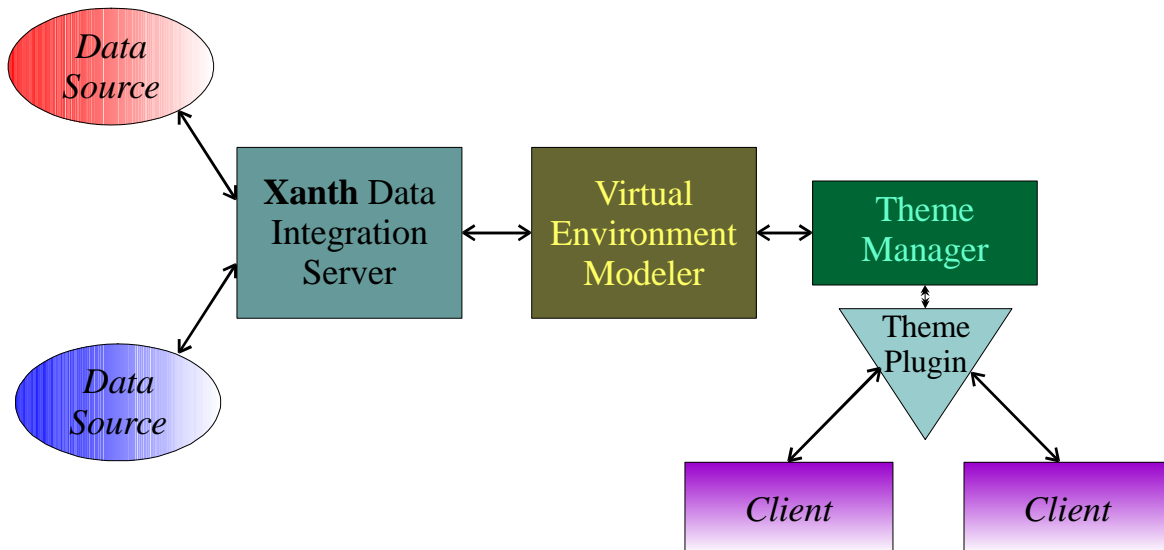
## Introduction

The **CHIME** (Columbia Hypermedia IMmersion Environment) 3D virtual environment framework supports multi-party/multi-team collaborations. Users see and touch project artifacts while “walking around” a virtual world, as in the *Myst* and *Riven* games, with MUD (Multi-User Domain) capabilities for cooperating with other users’ avatars, like *Doom* and *Quake*. CHIME maps and populates each environment with structure and content drawn from external (potentially legacy) information systems, including SQL/OQL databases, Internet and intranet Web servers, document management systems and so on, and invokes their conventional querying, browsing, editing, etc. tools through virtual world actions.

CHIME enables organizations to unify, manage, and quickly utilize disparate, distributed business-critical information assets.

## System Description

CHIME is extremely flexible and fully adaptable to an organizations’ existing information infrastructure. By providing a uniform access mechanism and “fun” group-oriented exploration facilities for organizational information, CHIME makes it easy for new team members to come up to speed and keeps existing project staff up to date.



*CHIME System Architecture*

CHIME’s Xanth Data Integration Server (**XDIS**) manages content metadata, not the content itself, so does not need ownership or control of the data it organizes, hyperlinks and annotates. XDIS’s core XML-based metadata engine employs small Protocol Plugins to communicate with the heterogeneous backend information repositories that actually “serve” the data.

CHIME's Virtual Environment Modeler (**VEM**) "tags" XDIS data elements with an extensible set of Virtual Environment Types. Base types include Component (an atomic data element representing a single piece of information), Container (which may aggregate other "child" data elements), Connector (a logical connection between two or more data elements), and Behavior (human users, software agents and external tools). Administrators define data element subtypes appropriate for their particular environments.

The CHIME Theme Manager (**CTM**) generates the virtual world's layout and objects from XDIS data elements augmented with VEM typing. A selected Theme Plugin supplies the metaphor for constructing the MUD-style 3D virtual environment. Data elements tagged as 'Containers' may become Rooms in the virtual world, with their child 'Components' visualized as Furnishings inside the Rooms. Connectors might be drawn as Doors, furnished Hallways or simply popup menus for navigating/teleporting among Rooms. CHIME clients render the 3D immersion onto users' displays. Changes to backend data sources are reflected in the virtual world through incremental or checkpoint scene updates, and vice versa.

## **Features**

### **Unified access to information.**

CHIME virtual environments bring together information from disparate data sources and unify access through the common immersive interface. The Theme Plugin lays out this data according to business processes, organizational structure, or any other mapping designed to assist team members in quickly finding information needed for the task at hand.

### **Legacy information integration**

The Xanth Data Integration Server and associated Protocol Plugins integrate legacy information systems. Application-specific hyperlinks and annotations can be added and traversed through Xanth's conventional GUI as well as CHIME.

### **Geographical/temporal distribution**

Physically dispersed team members inhabit a common virtual space, easing the difficulties of distributed projects. The 3D immersion enables stronger senses of user co-location and proximity among logically related materials than older systems like Orbit, eRoom, BSCW, NetMeeting, Lotus Notes, etc.

### **Scalability**

CHIME systems may be dynamically connected so that users "walk" between Rooms supporting different organizations. From the users' perspective, they inhabit a seamless virtual world, easing multi-team collaborations and information/process sharing. Of course, administrators easily limit access privileges.

## **General Specifications**

All CHIME server software is 100% Pure Java 2. To date, CHIME servers have been tested on Windows NT, Sun Solaris, SGI Irix and GNU Linux. 128MB RAM recommended for best performance.

The CHIME client is also written in Java 2 and utilizes SGI OpenInventor libraries for 3D rendering. The client has been tested on Windows NT, Sun Solaris and SGI Irix. Support for GNU Linux in FY 2000.

## **Availability**

4Q 1999 at <http://www.psl.cs.columbia.edu/>.

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