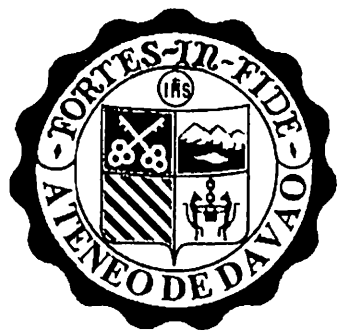
IMPLEMENTING AN OCX-BASED GATEKEEPER



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IMPLEMENTING AN OCX-BASED GATEKEEPER

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ABSTRACT

Voice over Internet Protocol (VoIP) is fast emerging technology predicted to soon replace Public Switched Telephone Networks (PSTNs). The protocol most common in VoIP – H.323 which was established by the International Telephony Union (ITU) is being used to develop applications for the entries in the network such as the gatekeeper. However to develop such applications would require the developer to hard code them using C/C++. In addition, the library of the H.323 protocol cannot be referenced by Rapid Application Development (RAD) tools because it is not Object Linking and Embedding (OLE) based. With OLE, it is possible to dynamically link files and applications together. An OCX is an OLE custom control, a special-purpose program that can be created for use by applications running on Microsoft's Windows systems. The proponents developed a reusable H.323's gatekeeper and OLE custom control component and a sample gatekeeper application using the OLE.

Keywords:

Gatekeeper, H.323, OCX, OLE, VoIP, PSTN

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Voice over Internet Protocol (VoIP) is the routing of voice conversations over the Internet or through any other IP-based network. This simply means that everything one can do through the regular telephone can now be done through the Internet using VoIP. It is a fast-emerging, cost-effective technology thus predicted to replace the existing Public Switched Telephone Networks (PSTNs).

Being a protocol most commonly used in VoIP, H.323 is an umbrella recommendation from the ITU Telecommunication Standardization Sector (ITU-T) that defines the protocols to provide audio-visual communication sessions on any packet network. It was approved by the world governments as the international standard for voice, video, and data conferencing, defining how devices, such as phones and computers, communicate.

With VoIP becoming more popular, more applications are being developed using the H.323 standard protocol.

One of the entities in an H.323 VoIP network is the gatekeeper. It provides services such as address translation and network access control for H.323 terminals, gateways, and Multipoint Control Units (MCUs). They can also provide other services such as bandwidth management, accounting, and dial plans to provide salability.

However, no common libraries and standard methods for development are used for H.323 gatekeepers; they are being developed independently by hard coding using C/C++.

Furthermore, the library by H.323 protocol cannot be referenced by Rapid Application Development (RAD) tools because it is not OCX-based; there is a need to create an OLE custom control base component to be used to build gatekeepers and methods of using it.

1.2 Statement of the Problem

This study intended to develop an H.323 gatekeeper custom control component to be used for Rapid Application Development.

Specifically, the proponents sought to address the following questions:

1. What are the processes involved in developing an OCX-based gatekeeper?
2. What are the properties, methods and events of a gatekeeper that must be exposed for RAD referencing?
3. How can the mandatory gatekeeper functions (address translation, admission control, bandwidth control, and zone management) be incorporated into the OCX?
4. How can a sample application on gatekeepers using the OCX be developed for the Windows platform?

1.3 Objectives of the Study

The proponents of this study aimed to develop a reusable H.323's gatekeeper OLE custom control component.

The specific objectives were the following:

1. To override the existing classes of the original gatekeeper and develop class(es) that can be inherited by applications using the H.323 custom control component.
2. To identify the methods, properties and events that will be exposed for the OLE custom control component and identify how they can be used thus hiding the complexities.
3. To incorporate the mandatory functions of an H.323 gatekeeper (address translation, admission control, bandwidth control, and zone management) into the OCX.
4. To build a sample application of the H.323 gatekeeper using the OLE custom control component on the Windows platform.

1.4 Significance of the Study

This study is significant for current and future VoIP gatekeeper developers, more specifically for business applications and developments. In addition the end-users will also benefit.

With no OLE custom control component and application development model existing that could be used for rapid development of H.323 applications, it will be

difficult for developers to create customized gatekeeper applications for businesses or organizations where VoIP calls need to be monitored and managed.

1.5 Scope and Limitations of the Study

The study focused on H.323 gatekeeper stack protocol libraries and its applications. The proponents developed an OLE custom control component that hides the complexities on using H.323 gatekeepers and enabling it to be used by RAD tools.

The OCX and sample application cover H.323's gatekeeper only and it did not cover other applications that could be done by using H.323.

The OCX-based gatekeeper has all the mandatory functions of an H.323 gatekeeper which are: Address Translation, Admission Control, Bandwidth Control, and Zone Management.

1.6 Definition of Terms

- *Address Translation*

  The translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network.

- *Bandwidth*

  The amount of data that can be passed along a communications channel in a given period of time.

- *Gatekeeper*

  A device that manages domains and provides call control. It is used to translate user names into IP addresses, to authenticate users and to manage

network resources. Gatekeepers also provide call authorization and accounting information.

- *H.323*

  An International Telecommunications Union (ITU) standard that provides specification for computers, equipment, and services for multimedia communication over packet based networks that defines how real-time audio, video and data information is transmitted.

- *MCU (Multipoint Control Unit)*

  A device that is used to moderate a videoconference of three or more end points (users at computers or groups of users in one room). An MCU may include a built-in H.323 gatekeeper for translating user names into IP addresses.

- *OCX (OLE Control EXtension)*

  A component software technology from Microsoft that enables a Windows program to add functionality by calling ready-made components. Generally called *OLE controls* or *OLE custom controls*, they appear to the end user as just another part of the program.

- *OLE (Object Linking and Embedding)*

  A compound document technology from Microsoft based on its Component Object Model (COM). OLE allows an object such as a graphic, video clip, spreadsheet, etc. to be embedded into a document, called the *container application*.

- *Packet Network*

A network where data is sent in small chunks, called packets. There is not a fixed path from the sender to the receiver, so each packet (chunk of data) has to identify the source and destination. Most corporate LANs (and the Internet) are packet based.

- *PSTN (Public Switched Telephone Network)*

The world's collection of interconnected voice-oriented public telephone networks, both commercial and government-owned.

- *RAD (Rapid Application Development)*

A concept that products can be developed faster and of higher quality through:

a. Gathering requirements using workshops or focus groups
b. Prototyping and early, reiterative user testing of designs
c. The re-use of software components
d. A rigidly paced schedule that defers design improvements to the next product version
e. Less formality in reviews and other team communication

- *Terminal*

A device, often equipped with a keyboard and a video display, through which data or information can be entered or displayed.

- *VoIP (Voice over Internet Protocol)*

An IP telephony term for a set of facilities used to manage the delivery of voice information over the Internet.VoIP involves sending voice information in

digital form in discrete packets rather than by using the traditional circuit-committed protocols of the public switched telephone network (PSTN).