Voice Over IP - A Changing World

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Title Developments

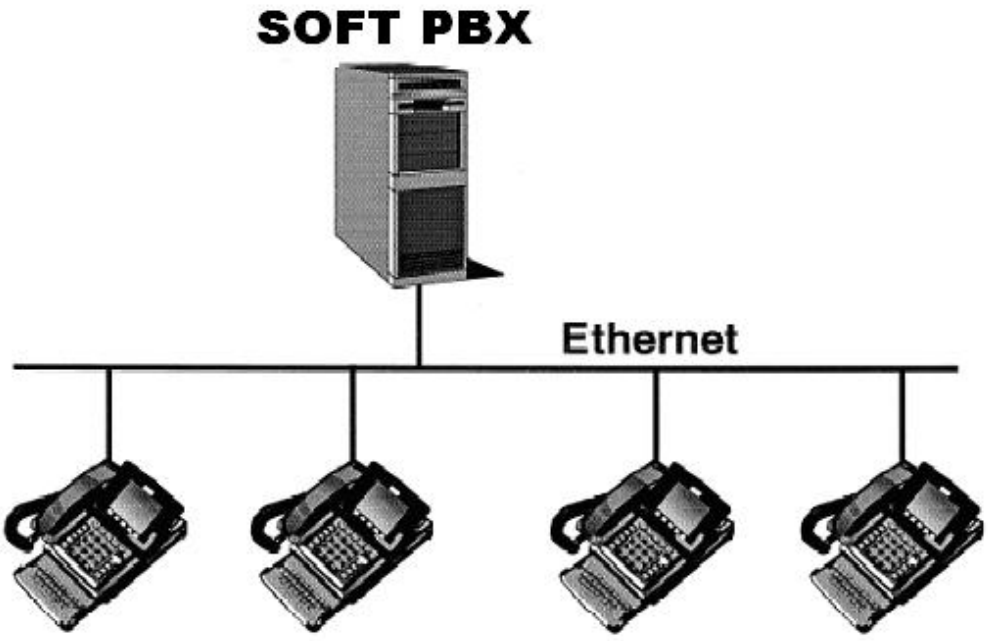
Title Developments is a global provider of IT services. It is our strong belief that outsourcing is not all about cost. Clients expect quality, efficiency and value addition while choosing a development partner. Like many other companies, software development is our core business, but we do not stop here. Our clients give us their simple ideas and we change them into scaleable solutions.

Voice over IP

We live in a time of rapid technological development, especially in the field of communications. Voice over Internet Protocol, or VoIP, is fast becoming one of the hot topics on technology. Businesses are finding that the dropping price points for VoIP services, in addition to the rapidly growing uses of the technology is making it an attractive alternative to public telephone networks. Cost is driving factor for switching the communication to VoIP. Its Implementation in PBXs is another type of VoIP known as Soft-PBX. It started with the idea of trying to use IP to transport PBX traffic.

1998 saw the first large wave of usage of IP telephony for internal corporate communications. PBX vendors adding IP telephony capability to their product offering aided some of this deployment, but more often it was the independent addition of an IP telephony gateway between the PBX and the data LAN. 1998 also saw the first uses of the so-called *soft PBX*. This was the first generation of the IP based PBX.

Soft PBXs could replace more expensive proprietary PBXs with equipment based on industrial PC platforms. The interface of the soft PBX to common wire line phones was done through Computer Telephony Integration CTI hardware that had been developed for call centers and other Interactive Voice Response IVR applications. The wiring to the phones remained the same, but inexpensive phones could be used in place of pricey proprietary units from the traditional PBX manufacturers.



Migrating from Hardware to Software

We have been working with one of our major client to develop a Soft switchboard using state of the art Computer Telephony Integration. The idea behind the solution was to migrate from the Hard Switchboard to Soft one.

Soft PBX is the term used to describe a software application that provides server-based telephony. That software on your server replaces a conventional telephone switch. Soft PBXs offer voicemail and integration with other server-based applications such as Unified Messaging and contact management systems. There are many soft PBXs are available in the market. Cisco is the market leader with its Cisco CallManager.

There was however one problem with all soft PBXs. The end users (Operators) were reluctant on switching to software applications, as these were very different from the hardware procedures, with which they felt easy.

After the availability of Soft PBXs, an effort was required to produce an interface that gives least unfamiliarity to the end users. That was the time; we conceived the idea of developing Console.

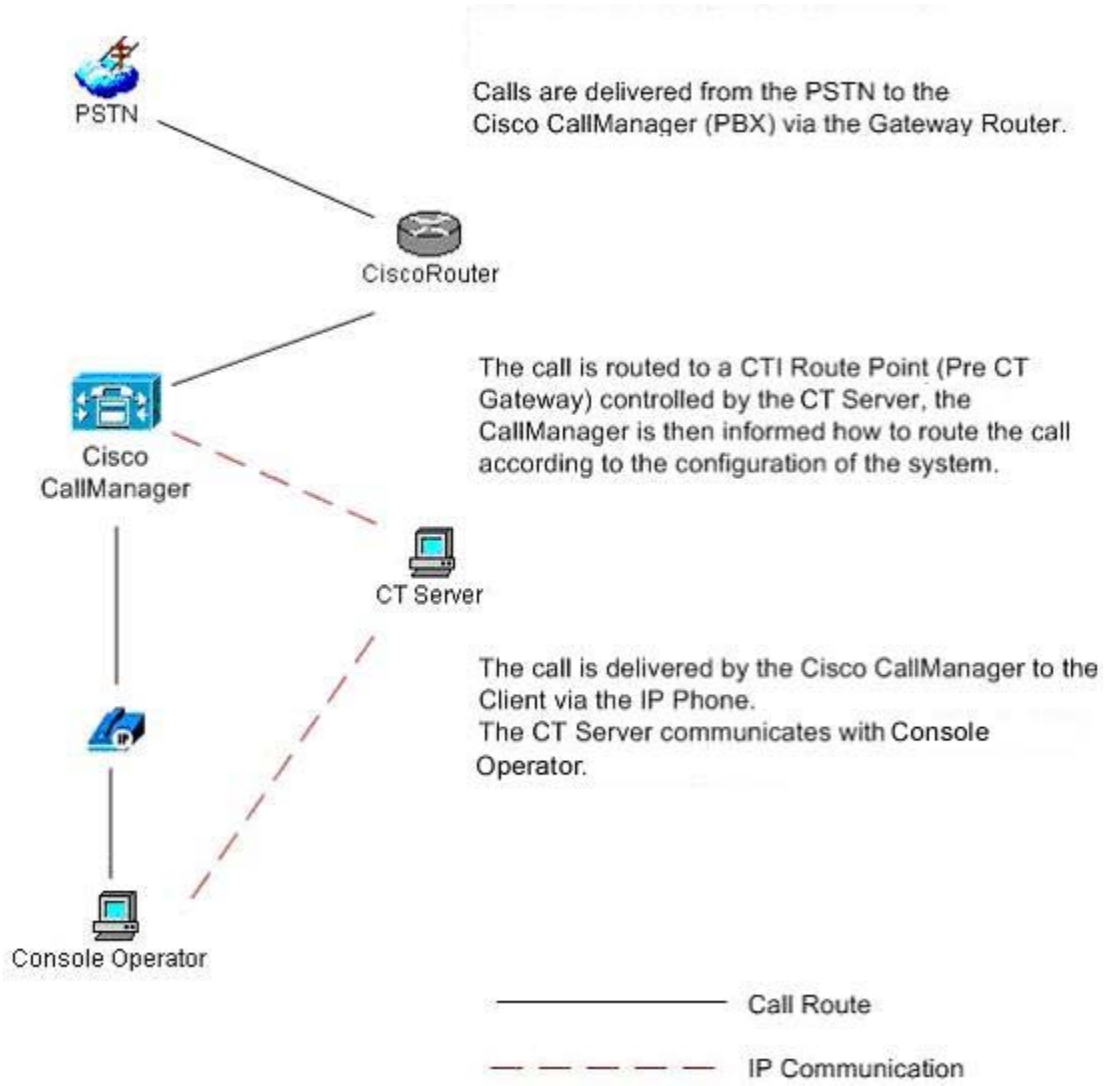
Understanding old Switchboard
The software-based console was an idea directly conceived from traditional Hardware switchboard. Objective behind the project was to provide all the functionalities in a software-based console that are available in Hardware switchboard. But the research went beyond just providing them the functionalities in software. A survey was conducted to have an insight as how an operator envisages his switch. Habits of the experienced operators were studied. Even the pattern and name of the keys on the switch were taken into account. After this exercise a design was prepared for software based console. A word that can describe this product best is User friendly.

Result of this research was speed of delivering calls, access to information, using keypad rather than mouse. The finished design was matching the traditional switchboard not only in terms of Look and feel but also in Keystrokes. We designed a new keyboard for the operators using this application, and named the keys as they were using them in previous scenario. Even the place and format of the keys were retained. All functions done with right hand were kept on the right side of the keyboard.

Technical Design

Once our client signed off the functionality and methods of control, there began the development of class-leading Console. This involved providing entire switchboard functions using a keyboard. Operator can use a general PC keyboard or a special operator keyboard with the Console. Console was designed to carry out operations with one hand and centered around the numeric keypad and surrounding keys.

Communication between the Server application and the CallManager is done via Cisco TAPI. The below diagram explains the standard call flow and describes how a call is delivered into the Console system.



In essence, the CallManager needs to be configured for the call from the PSTN to be routed to a Pre CT Gateway device.

Features of new solution

Basic Switchboard Essentials

Console Connect offers every standard feature a switchboard operator requires handling internal and external callers, quickly and efficiently. To enhance the power of the switchboard attendant, calls that come into the system can be tagged with CTI information including the queue, the caller, and the company calling. This information that is easily retrieved from the database (or general CTI information) empowers the operator to deliver calls swiftly and efficiently.

Console is a powerful software application that enables an "attendant/operator" to receive and route calls, similar to a traditional switchboard. This virtual switchboard, however, has greater functionality than most traditional systems.

It's easy to use and simple to configure. The virtual on-screen display of the entire telephone network and the ability to drag and drop icons adds a new dimension to traditional telephony. And its cost advantage makes it more readily available to all who need it.

Freedom to move
The application suite is based around a client-server architecture, which means that the switchboard operators/attendants can sit anywhere on the network. Once they log in, their profile follows them. In an IP Telephony environment it is possible for the server to reside in one country and the clients to be located in others.

Hold and Hold Recall
Calls can be put on hold by using the PgDn button if using the general keyboard. Music on Hold from the PBX source will be played. The system will be configured to alert the operator once the Hold Recall timer has been exceeded, so that the operator is alerted.

Transfer and Transfer Recall
Once a call is transferred to a target extension, it remains ringing until either the call is answered or the transfer recall timer is exceeded. At this point the call returns to the originating switchboard so that the caller can be dealt with.

Hold With Notes
Each call can be held with notes. These notes are shown when the mouse cursor hovers over the call. This enables the operator to remember why the caller was put on hold and quickly distinguish between the held calls and for whom the caller was holding for.

Call Park and Call Park Recall
Call Park is for calls that need to be announced on a tannoy or paging system so that the user can dial the virtual extension at any phone and pick up the call. This is particularly useful in environments where people are not fixed to a desk. A good example would be a department store or hospital.

Busy Lamp Field
The term Busy Lamp Field is derived from a traditional switchboard, which has a coloured bulb by each extension. When lit it is busy, when unlit it is available. In software we have replicated this and enhanced the information about the extension by using a collection of icons to show busy on incoming call, busy on outgoing call, and Call Forwarded information.

Speed Dials
Each operator has the ability to create his own set of speed dials, these are simply internal or external numbers they call on a regular basis such as couriers, florists or taxicabs.

Unrivaled Features

After developing the console as a software replacement of traditional switchboard, we aimed to have an edge over our competitors. We tried to put in features in console, which were not provided by other companies. This pursuit of perfection is a proven record of our effort to stay as a market leader software vendor. Following are some features that took our developed product ahead of other available in the market.

Internal and External Directories
It is possible to display both internal and external directory entries. This information can be imported via ODBC import mechanism, Microsoft Excel import mechanism or from the PBX. Once imported, the entries can be used for reference as well as a click-to dial/transfer facility.

Multi-Language
To make the use of console easier, it supports multi-language. It is available in English, French, German, Italian and Spanish. Soon more languages will be covered.

LDAP Synchronization
LDAP synchronization for console supporting Microsoft Active Directory and Netscape iPlanet has been developed and now it can exchange records for directories with a larger pool.

Call Recording
Console comes with integration into Witness (Eyretel) Voice recording for "Record On Demand" capability. There is a record button on the application GUI. Pressed at any point throughout the conversation, the entire conversation will be saved.

Call Paging
Paging is a function that has been provided by any other company in a call centre environment on Cisco IP Phones. Even Cisco does not give an easy approach to develop such a solution using their IP Phones. We developed it using Cisco XML Services APIs. An operator can send a page with and without call to any other IP Phone or logged in Operator.

Use of Keyboard
Operators are in a habit of using Keys instead of mouse. Keeping this in view, we tried to provide all most all the functions in console using the Keyboard. A unique keyboard is also use by operators. We have programmed the keyboard keys for performing different functions at different occasions. For example, the Enter key is used for many functions like, Hold, Recall, Answer and End Call depending on the state of the call. This help operator of doing different things with the same key, and reduces the overall time required deal the calls.

Problem faced resolved

The project of developing Console was not without problems. There have been many barriers in the way. We overcome many limitations of Software and Hardware with the help of our will and dedication. Some of them are given below briefly.

The soft switch Cisco CallManager was in its initial period of Launch. There had been many occasions when we came to know about some problems in Call Handling but after a thorough interrogation we came to know that this was a Cisco's problem and our software was doing fine. We have registered many Cisco TAC Cases, telling Cisco about the bugs and limitations of Cisco CallManager.

There had been a problem with Windows Sockets, which were designed to take the data but not more than 8k. As our solution was being adopted in the market, many big call centres also installed it in their premises. We came across a problem that our system couldn't handle a large pool of contacts. This was actually not our problem; we had to re shape the window sockets to make it useful in our architecture.

We faced some problems in Deployment of our system also. This solution requires all the software and Hardware on the network to be completely synchronized. Many a times we had a stuck call issue and later on found out that MTU (Maximum Transmission Units) set on Routers and Machine running the Network Card were not accordingly synchronized.

Success

Operators using traditional switchboard were reluctant when asked to shift to a software-based console, but faced no problems when given our designed Console. Console developed for Cisco CallManager platform has gone from strength to strength.

We looked for the features in old system and added them into our Console software. On the top of it we added as many feature as we can add to facilitate the user through software.

Console solution is software based. Upgrading the solution is easy; you don't have to abandon your old system. What is required is just an upgrade utility and you have more features in running system at a low price.

With Console system in place it is possible to administrate the whole workplace from central location. This definitely gives an edge over traditional systems where Administration is scattered and it is difficult to get the reports for every corner.

Console is always developing. We are keeping an eye on emerging technologies and will update it wherever there is a need in the market. Moving to Console will definitely secure your investment and will keep you up in the market.

Console is a part of Client Server application architecture. This is definitely faster in service than any Web based solutions available in the market.

Operators sitting on PCs have access to any set of records and answer the calls in a better manner.

Console system is faster and it enhances the productivity of a call centre. Lesser number of operators are required to handle the calls as compared to in a traditional system.

Being a soft solution, Console is a forever evolving. We are committed to its software becoming accessible; in next version both a blind compatible operator console and one adapted for visually impaired users will be released.