The Ghost inside the machine
Presence in the Contact Centre and the Enterprise edge
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One of the biggest challenges facing service providers is that of supporting the services which ubiquitous access to multimedia applications brings. One application which is becoming common-place on user’s devices is a presence client (the evolution of the instant messaging client that has already become prevalent). This application creates the biggest opportunity for service enhancement by providing customers with an always-available HelpBuddy©.

1 Introduction

In the near future as the third generation (3G) of mobile networks become common place in many carriers, IMS becomes a platform for wireless and wireline services and the medium future as fourth generation (4G) networks gather pace (LTE, WiFi, WiMax air interfaces and VSDL combined with IMS cores), there will be a need to support a wealth of services that will be accessible through multimedia terminals and home PCs.

When services work well, customers don’t worry, but when things go wrong, the need for prompt access to help becomes essential. For network operators 24x7 customer care becomes business critical not only as a basic service, but can also become an important differentiator if the service offered is better than the competition.

This paper proposes the use of a presence-based application architecture that can be used to perform a similar task to the Microsoft Office Assistant™. With the difference that this application is linked to a live contact centre that can support the customer’s requirements for help. The delivery of assistance can be by all the means available to the contact centre: Voice Portals (IVR), Web-based FAQ, text-chat, Co-browsing and of course live customer service representatives, fully utilising all the benefits that Unified Communications Brings.

2 Presence Centre Architecture

CTI is undergoing a significant boost from the integration of voice and data on a next-generation network. The first generation of CTI products brought about the control of circuit switch based ACD and PBXs and allowed for increasing complexity over the control of call routing through the use of information from customer databases.

Second generation CTI allowed for the integration of systems that provided a view of the customer and their relationship with the organisation (labelled Customer Relationship Management (CRM) tools), web collaboration and email routing with conventional TDM platforms.

Next-Generation CTI is combining Voice over IP (VoIP), CRM and IP-voice servers to bring a level of integration beyond that which was previously possible to create packet telephony call centres [1]. The next-generation CTI servers will combine the ACD routing capabilities, but go beyond this to provide a truly integrated solution for ‘contact’ routing. At the time of writing a number of vendors have these multimedia routing engines (Genesys Labs and Oracle ContactCenterAnywhere™ for example).

Presence is a new service enabler that has gained significant interest in the telecommunications and Internet industries as a means of combining a number states.
that a person can be in to form a holistic view of their means and desire to communicate. It can combine for example, location information, availability, device type, mood and communications medium. If we consider the concept of what a contact centre embodies, it is in fact a presence service. The desire to communicate via some means (PDA, VoIP, email, text-chat, etc.) combined with the current state of the communicating entities (agents). The work on standardising presence in the IETF is based on the use of SIP to support much more information about the status of the presence centre agents they are trying reach. SIP’s inherent scalability and extensibility also makes for a very happy vendor community, where servers can be made to scale from small 20 seat operations to meet the demands of the SME market, to tens of thousands of seats capable systems to meet the needs of the xSP market place.

The SME end can be easily service with Open Source solutions such as Asterisk and OpenSER. Whilst the large scale carrier multi-tenant end can be served with the combination of IMS, SIP Application Servers and hosted contact centre solutions such as Oracle’s CCA.

The architecture for a presence centre is shown in Figure 1, this is not a TDM solution, there are no circuit switching components to the SoftACD application server (presence server). All communications between caller, agent and SoftACD are performed by SIP messaging. In addition the web servers utilise a J2EE framework with SIP Servlets and Web 2.0 capabilities (AJAX) to allow for example push-to-talk functionality, where a button on a web page can be used to initiate a conversation between the person browsing the website and an agent, either as voice communications or text-chat, with SIP being used to establish and terminate the session(s) and pass instant messages between parties.

Figure 1: Presence centre architecture

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1 IETF working group called SIMPLE – SIP for Instant Messaging and Presence Leveraging Extensions
CRM applications are hosted on the application server, with access to Enterprise databases and Enterprise Resource Planning (ERP) systems for example. The application servers that will make this possible are already being deployed in the form of products from Oracle, such as their application server products, BEA systems WebLogic™ server and of course IBM’s WebSphere, and of course Open Source Application Servers such as RESIN.

Home agents are easily accommodated through the use of Digital Subscriber Line (DSL) and Voice over DSL (VoDSL) services. Where appropriate a multi-vendor environment can exist, were SIP phones from different vendors (for example Snom, Aastra or Cisco) establishing connections via the presence server can also be accommodated via the open nature of SIP.

To explore this architecture further, let us take each of the major components in turn. Contact centres containing agents are able to existing in locations that are remote from the network where the servers that run the applications that perform the contact routing reside. The contact centres will not need large amounts of infrastructure aside from desks and multimedia equipped personal computers. In fact the introduction of Microsoft Windows XP and the Instant Messaging client shipped with this product; meant a SIP client came free with the desktop OS!

The applications that the agents (or customer service representatives) require to perform their role will be able to reside within the network, to make modification and roll out of new features easier. This also opens up the opportunity for IT managers to outsource the support of these applications to application service providers. A good example of this is Oracle Siebel on-demand and Contact Centre on-demand.

All voice connections between the agents and customer will be transported through an Internet Protocol (IP) network that can give Quality of Service (QoS) guarantees. This is made possible through the use of Multi-Protocol Label Switching (MPLS) and high capacity fibre links. It is possible for service providers to provide secure service to multiple customers from the same infrastructure in this way too; MPLS is able to segregate (and aggregate) the traffic for each customer to create a virtual private network (VPN), which is the cloud in the centre of Figure 1. Multiple remote contact centres will be able to function as one large virtual contact centre in this way.

Through new IP-IVR media servers, it is possible for service providers to run contact filtering services using speech recognition to assist customers with their enquiries, even fulfilling the enquiry without having to speak to an agent. Whilst existing IVR platforms provide these facilities IP-IVR will bring economies to the connection of customers to the IVR and agents. IP-IVR through the use of VoiceXML can also bring a closer integration with websites, allowing customers to get access to the same (consistent) information irrespective of how they chose to contact an organisation. This will provide the voice portal business the boost it needs to launch voice portal applications.

Contact centre presence servers (or software ACDs) are the intelligence that will make all this possible. Software ACDs provide SIP based media control that will connect customer with IVR systems and agents (using presence state updates to keep track of the status of all the components it controls). They will also communicate with softswitches and the IMS proxy servers via border controllers, to enhance call routing for callers. SoftACDs are able to route telephone calls, web-based text-chat requests and emails. They can by virtue of technologies such as the Java connector architecture (J CA) and Java Database application programming interface (JDBC) .NET or Ruby ActiveRecord, have the ability to integrate with a large variety of enterprise information systems (EIS). The integration with EIS systems will enable the rules used to route contact requests to take in to account real-time customer information such as location updates for mobile customers, or device type.

Application Servers provide the web integration and in addition are able to provide web collaboration features, allowing customer and agents to simultaneous view the same web pages and converse in real-time about the products or services on offer, or to provide support for the more complex applications.
And finally home agents will be able to use the same facilities as their colleagues in the contact centre, since all the applications are hosted in the network on application servers. Digital subscriber lines will provide the bandwidth necessary to seamlessly carry voice and data to home agents.

In summary computer telephony integration is blazing the trail of convergence towards the next-generation network services. It could be argued that CTI forged the path to convergence even before the ideas of a next-generation network were formed. There is no doubt in the authors mind that contact centres will continue to push the boundaries of computer telephony integrate and will be the standard bearer for convergence, with the release of convergent CRM and telephony server platforms, contact centres are the future battle ground for NGN service providers.

Some of the ideas presented in the previous sections may seem like flights of fancy, however products already exist from both the big names: Aspect, Avaya, Nortel Networks et al and some other players such as CosmoCom and Oracle. These products already provide most of the features discussed, except the IMS integration.

3 The impact of next-generation wireless networks

The current deployment of 3rd Generation (3G) networks across the globe is bringing with it a huge potential for ubiquitous access to multimedia applications.

The capabilities of 3G networks are created through a combination of technologies both in the air-interface (UMTS Terrestrial Radio Access Network – UTRAN) through the use of (W-)CDMA and HSPA combined with the core transmission IP network and IMS core[3].

Broadband wireless services are currently being provided by GPRS and EDGE in the current second generation (2G) GSM networks to create 2.5G networks [4] and by CDMA or HSPA in the 3G networks. In the next five years it is expected that technologies such as WiMax and Long Term Evolution (LTE) will increase data rates in the air interface to the order of 20-100Mbps. These network enhancements are labelled 4G.

Both the above changes are enabling the use of new devices and more feature rich PDAs to provide an anytime, anyplace service.

The combination of 3G femto-cells and 4G technologies [3] is giving rise to the possibility for add-drop contact centres. Were the combinations of the network-based presence centre technologies, with the wireless access capabilities facilitate the set-up a contact centre with minimal building infrastructure overhead. The close integration of 3G and 4G networks and presence centres also creates the opportunity for wireless customers to be presented with a 24x7 help agent on their devices (more on this in section 4).

Wireless in the form of the 802.11 and 802.16 (Wi-Fi and WiMax) standards, LTE and VDSL, look placed to deliver high-speed access to a whole new (unsuspecting) audience. Providing such services as online tour guides[5] and high-speed Public Access Wireless Networks (PAWNs) from cafés and restaurants[6]. With this capability, it becomes increasingly easy to provide a building with access to a network based service such as a contact centre technology.

4 H@lpBuddy™

Based on the previous two sections that summarise the rise of the presence centre and the ability to have mobile devices with multimedia capabilities to get high speed access to network-based services; there is a clear need to be able to support applications, services and customers of these services. There is clearly a necessity for on-line help to ease the acceptance of new services in any future always-on world.

The rise of the H@lpBuddy™. A contact centre softACD can advertise a general presence state that can cover the availability of contact centre contact channels this state can be reflected on a device through an

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2 We already have WiFi in Coffee outlets and metropolitan WiFi networks such as the cloud.
instant messaging (IM) client as buddy in the IM application buddy list.

The state represented can reflect not only whether agents are online, but also what types of agents are available: text-chat, MMS, email, co-browse or voice.

When a problem occurs, that a customer needs help with, they can select their help buddy to set-up a connection directly to a contact centre agent. This places the customers request in the softACD multimedia queue for allocation to the next available agent.

The HelpBuddy™ can also route to automated services such as IP-IVR systems and automated email and text-chat systems that have FAQ self-help engines that can provide the frontline processing and fault finding before a more expensive resource (person) is selected.

With the use of voice recognition and knowledge management systems, sophisticated automated services could provide for the majority of situations.

With the addition of CRM customer profiles, more complex routing decisions could be made to tailor the experience for different customer segments and even on different customer presence information (device type, location, mood, communications preferences).

One closing remark around the concept of a HelpBuddy™ is that this capability is available now, the recent launch of Microsoft Office Communications server 2007 brings all of the presence and online collaboration capabilities to the enterprise. IMS standardisation from the 3GPP also brings the ability through SIP signalling interface for applications to access IMS customers to create complex presence aware applications using an IMS Application Server (AS). The 3GPP Release 6 and above, and ETSI TISPAN discuss a number of different types of application server scenarios, including presence aware applications.

## References

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