Introduction to Media Resource Brokering

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The Voice Over IP (VOIP) and multimedia landscape has come along way since the its first baby steps in the 1990s. As technologies have evolved in conjunction with ever improving networks, industry and consumer confidence is growing in a technology that is the largest development in the communications industry since March 10th 1876 when Alexander Graham Bell summoned his assistant with the words "Mr Watson, come here – I want to see you". While the progression towards Internet Protocol (IP) based communication has not been as rapid as first expected, it is certainly gaining market share as new networks and upgrades to existing networks are utilising the latest technologies. The evolution of companies such as Skype have also led to an increased awareness amongst the traditional telecommunications giants who are watching such new, agile companies move into their territory, reducing their market share. As an example, Skype now has over 400 million users worldwide and was responsible for 8% of all international telephone traffic in 2008. Skype also administered more than 8.4 billion minutes of calls in 2008 through its interconnect service to the Public Switch Telephone Network (PSTN). Traditional telecommunications giants are having to adapt at a faster rate than they would have liked which is accelerating investment in IP based networks and services.

A major functional entity since the conception of VOIP networks is the media server which provides network services such as Interactive Voice Response (IVR), multimedia mixing for conferencing, Automatic Speech Recognition (ASR) and Text to Speech (TTS). This enables well known features such as voice-mail, email-to-voice, automated menus systems as well as next generation multimedia functions. The media server market has shown continuous growth in association with IP based technologies and is forecast to continue expansion for the foreseeable future as new applications and services are deployed. To date, new IP based applications and services have very much been developed and deployed in isolation as service providers make tentative steps with their next generation networks. This has resulted in a plethora of stove pipe applications that exist in the network as separate islands. Each island is served by an appropriate number of media server resources that are provisioned to cater for peak usage levels.

Figure 1 illustrates a typical deployment of new IP based applications that are using dedicated media server resources to fulfil their media resource requirements. This approach has adequately enabled the current generation of services to be deployed in trial and live environments. As next generation networks continue to expand and place higher demands on media resources, manageability and efficiency become a major issue. Traditional peak planning exercises carried out on a per application basis results in a large amount of unused, wasted media resources that stand idle for the vast majority of the time. There comes an inflexion point in the life cycle of network planning where the costs of such idle resources become a major issue and will only ever increase as the network grows. In association with monitory costs of idle media resources there is also the environmental impact to consider.

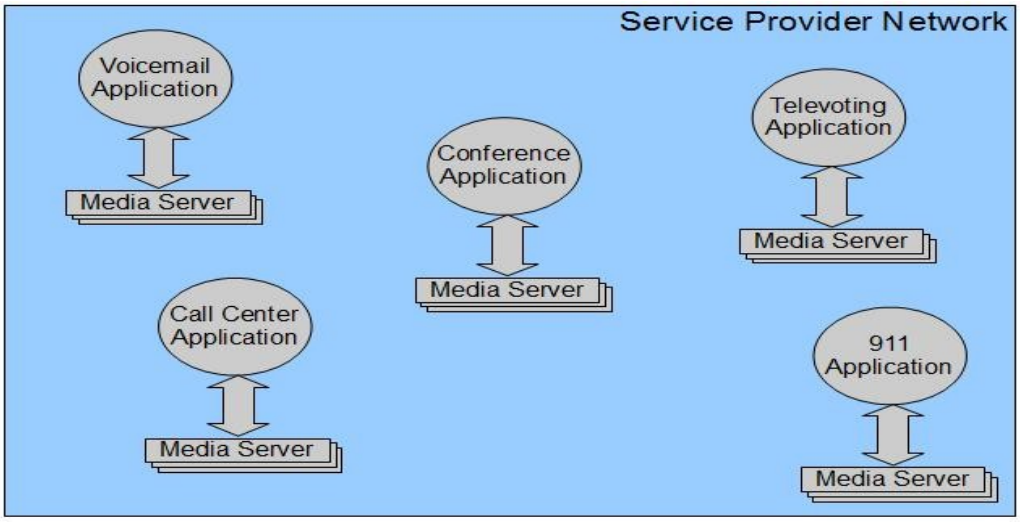

Figure 1 – Dedicated Media Resources

This model is clearly not feasible for expanding next generation networks and also not conducive to the rapid deployment of new services which has resulted in a technological movement in the industry to solve this important issue. To gain optimum usage, media resources are now being treated as a general network resource that are not tied to a specific service or application. Figure 2 illustrates this at a conceptual level.

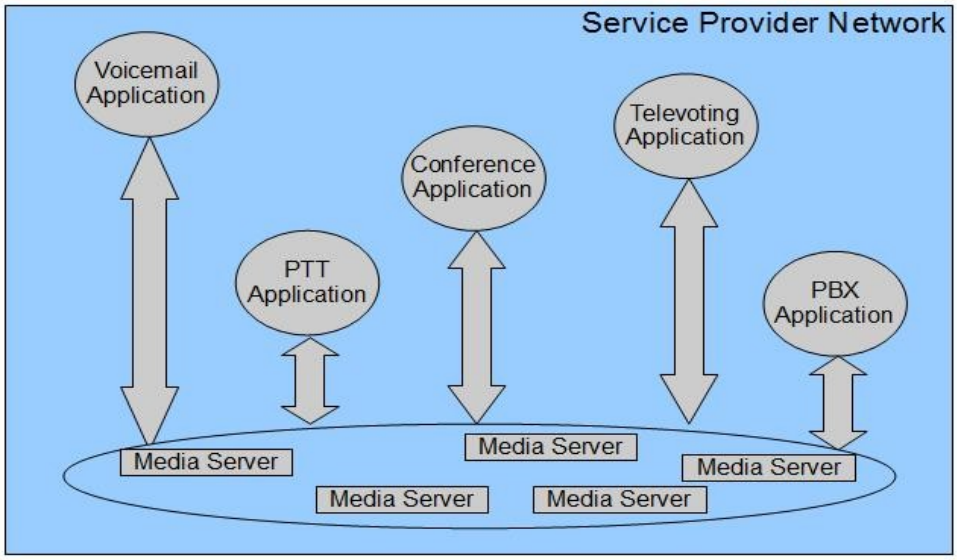

Figure 2 – Shared Media Resources

The sharing of media servers allows for far greater utilisation of formerly idle media resources. It also reduces the need for dedicated media server pools responsible for specific applications in the network.

If it were as simple as just adding more media resources to a shared pool in the network the principle would have been adopted since the advent of IP based multimedia communications. The reality of the situation dictates that for media server resources to act as a general network resource, intelligence is required. Media servers can have a range of different capabilities depending on the manufacturer and model. For example, some media servers might support voice only and not support video, while others might have specialist Automated Speech Recognition (ASR) capabilities. Typically a large network will have multiple vendors supplying media server

resources, each supporting different capabilities and capacity levels. When centralising media resources it is also difficult to allocate available resources on a particular media server resource. For example, a conferencing application that wishes to create a conference for 500 participants needs to be informed of a media server that has the required resources. While the benefits gained from sharing media resources will become a necessity, it will be equally important to ensure that they are managed appropriately and utilised to the maximum. This includes taking into account factors such as peak traffic load and planned maintenance. A new network entity called a Media Resource Broker (MRB) has emerged as the solution to managing media resources in large, complex next generation networks. An introduction to the MRB follows.

MRB Overview

The MRB is an intermediary device that has two functional roles which allow media resources in a network to be fully utilised. It first acts as a consolidation point for media servers. This involves collecting information relating to the capabilities of the media servers deployed in the network. It also monitors the status of media servers and track resources available to service applications. The second functional role sees the MRB acting as a federation point for applications requiring media resources. The MRB receives requests from applications and uses its view of media resources to allocate an appropriate media server.

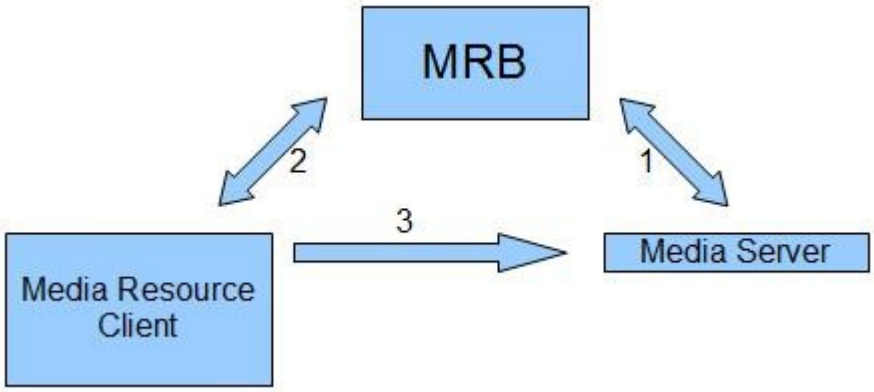

Figure 3 – Media Resource Broker

Figure 3 illustrates an MRB deployed in the network. The media server communicates information allowing the MRB to collect and collate usage and capability information, as depicted on the right hand side of the diagram (1). An application communicates with the MRB to make requests for media server resources when required, as shown on the left hand side of the diagram (2). The MRB will determine an appropriate media server for the application and facilitate its usage, as shown by (3) of the diagram.

It can be concluded with certainty that evolving networks are focussing on IP technologies that will provide an exciting range of multimedia applications and services. The process is very much in its infancy with only a limited number of live deployments providing a range of services. The majority of IP based communications today focus on 'toll bypass' techniques that use IP connectivity between PSTN originating and/or terminating users. While this has been a useful stepping stone for the technology, it does not fulfil the potential of delivering new and exciting services which will ultimately require increased media resources in the network. Major Service Providers are making extensive plans for their networks that aim to provide the vehicle that will make the most of investments in new IP networks and stave of revenue eating competitors such as Skype and the iPhone. IP based media servers will play a large role in such an evolution but unless they are managed effectively, the increased network complexity will place an artificial ceiling on the

profitability of adding new services. Introducing an MRB early into a VOIP based network will provide a scalable intelligence point that will provide vital management and monitoring of media resources. As discussed in this article, allowing the efficient management of combined media resources is essential in large, expanding networks and provides capital expenditure (CAPEX) savings immediately. Allowing central management of media resources in a network also greatly simplifies the operating costs (OPEX). Both CAPEX and OPEX savings will increase dramatically as costs remain linear compared to the exponential costs of managing highly complex networks that will emerge without an MRB.