



Call Completion

Whitepaper

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Overview

Video telephony or Video calling has been around for some time now. However, the user experience for Video Calling, when the called party is unable to receive a video call, is questionable. In most networks today, if a caller attempts to place a video call to another video subscriber who is unable to receive the video call (out of coverage, busy, non-3G subscriber) they are usually either provided with a message on their handset informing them that the call cannot be placed or, dependant on the device, they may be prompted if they wish to place a voice call instead - even if the calling party is within 3G coverage.

In recent years the main driver for video calling has been via the expansion within many mobile networks to provide 3G services. For a variety of reasons, however, the uptake of video calling and the projected revenues have been very poor.

The Challenges

The issues and corresponding challenges for most mobile operators are quite consistent.

- Low to medium Penetration rate of 3G handsets
- No way to know in advance whether the target subscriber has 3G
- Incomplete or low 3G coverage
- Interconnect problems between operators
- No Automatic fallback from video to voice



- Video calls may not terminate properly
- Poor User experience
- Consumer loss of confidence in video calling (“doesn’t work” syndrome)
- Loss of call termination revenues

The failure for consumers to have any confidence in basic person to person or P2P video calling due to the issues outlined above also impacts the potential for other, more advanced video related services.

Internal market research carried out by a variety of 3G operators concluded that when callers attempt to place a video call they expect the call to be completed. Depending on which mobile operator you listen to the market research either indicates that callers expect the video call to complete with video or to be offered a voice, without the need for the caller to redial.

Currently very few solutions have been implemented that will cater to the conditions outlined above. Of those that have been implemented they have predominantly focused on 3G subscribers, which are often the minority of the whole subscriber base and therefore neglected the majority of subscribers.

Potential Solutions

In order to improve the user experience, help capture call revenue and potentially stimulate additional call revenues, there are several potential solutions. Not surprisingly each solution has its own set of benefits and weaknesses.

Call Termination

Call Termination is a very simple solution which, when the caller is unavailable (out of coverage, busy, non-3G subscriber) simply answers the video with a video prompt and informs the caller that the video call cannot be completed.

Benefits	Weaknesses
<ul style="list-style-type: none"> • Completes the video call • Captures call termination revenue • Simple to use • Quite easy to implement • Can work whether the called party is a fixed, 2G or 3G subscriber 	<ul style="list-style-type: none"> • Does not inform called party of call • Does not stimulate new calls • Requires infrastructure investment in: <ul style="list-style-type: none"> ○ 3G Gateways ○ Media Servers ○ Soft switches

Video Mail

Video Mail is essentially a visual version of voicemail. As such the interface is virtually the same, although instead of being presented with an audio voicemail prompt, the subscriber is presented with a series of video prompts asking the caller to leave a video message for the recipient. The message is then placed in the recipient's mailbox, the recipient is notified of the new video message and is prompted to place a video call to the system to view the recorded message.

From a user perspective the main drawback of Video Mail is that it requires the recipients to be 3G subscribers in order for them to be able to call the Video Mail system and view their messages. Secondly 3G coverage is also a concern. Although web access can usually be provided, this is quite often not a preferred option for most mobile operators.

Secondly, in order for the video mail service to appear familiar to existing users of voicemail, it is often required to have the same call-flow and user interface as well as user options. Due to the evolution of voicemail and it's quite often very extensive user interface, duplicating this in a video form can be a lengthy task and for some user options impractical.

As such, many operators have requested that their new video mail system either be an upgrade of their existing voice mail platform or be part of a broader 'next generation messaging' platform, which includes video mail, voicemail, e-mail and possibly a few other components.

As most voicemail system are quite old, this has meant that the video mail has been made part of an operator's new strategic requirement for a 'next generation messaging' platform. As a long-term, high cost, strategic infrastructure, this has unfortunately meant very long procurement processes and very slow deployment. Secondly, as the revenue from voicemail is more easily justifiable, the requirements and deployment schedules for video mail have taken a back seat, often following several months behind the initial voicemail deployment.

Finally, there is another factor that is not in favor of video mail as an extension to voicemail, which is associated with the target market for video services. In many network operators, especially in Europe, the penetration of voicemail is quite low and is often seen as more of a business tool rather than a mass consumer tool. Therefore, within the 18-25 market and the pre-pay market, voicemail penetration can be very low as users prefer to use text messaging rather than exchanging voice messages. This problem presents a dilemma for many operators as their

target market for video calling and video calling services are the young 18-25 market, a market where voicemail penetration is low and video mail could be even lower.

Video mail is often seen by the messaging purists as the most logical way forward, but it comes at a price (often a very high price), is slow to deploy and doesn't always hit the target market correctly.

Benefits	Weaknesses
<ul style="list-style-type: none"> • Completes the video call • Captures call termination revenue • Simple to use 	<ul style="list-style-type: none"> • Only for 3G subscribers • Slow time to market due to: <ul style="list-style-type: none"> ○ Part of next generation messaging deployment • Requires infrastructure investment in: <ul style="list-style-type: none"> ○ 3G Gateways ○ Media Servers ○ Soft switches ○ Message storage

Video Fallback to Voice

In order to cater to callers who simply want to have their call completed, if the recipient isn't capable of receiving a video call, many operators believe this can best be accomplished within the network by allowing the video call to be completed as a voice call.

This solution is great for completing calls, but many subscribers expect to get some form of video experience, not just voice, when they place a video call. The motivation for callers to place a video call over a voice call is the fact that the caller feels it is more appropriate as the content of the call contains more than just voice. For instance, if you wanted to call someone to tell them of a particular event, birth of a new child, Christmas or New Year festivities, then a voice call would be suitable. If you wanted to show someone your new baby or New Year's fireworks, a voice call would be useless and a video call would be far more appropriate. In these situations fallback to voice can be very frustrating as the caller is often not even presented with the option to leave a video message.

The most preferable solution would allow someone to place a video call and if the recipient was unable to take the call, provide them with the option to leave a video message or place a voice call.

Unfortunately, due to design limitations in the current fixed and mobile networks, video fall back to voice is technically very complex or an expensive use of network resources. At present, a video call cannot be 'down-graded' to a voice call as the call setup of a video and voice call is very different. Changes in the network specifications have been made but these will take some time to implement within operators. Alternatively, network based video applications can be used to 'bridge' a video call with a voice call, however these applications put high demands on network resources and the network applications themselves.

Benefits	Weaknesses
<ul style="list-style-type: none"> • Completes the video call • Can be simple to use 	<ul style="list-style-type: none"> • Slow time to market due to: <ul style="list-style-type: none"> ○ Technical limitations in networks ○ Still requires video messaging • Potentially requires infrastructure investment in: <ul style="list-style-type: none"> ○ 3G Gateways ○ Media Servers ○ Soft switches ○ Message storage

Video fallback to Voice is a very nice application and is a good way of completing call traffic, however, for it to be really successful, changes need to be made in the network and for those calls that can't be completed at all a video messaging platform of some form would still need to be implemented.

Call Completion

Call Completion is often seen as a slightly more advanced version of Call Termination. Instead of simply presenting the video caller with a video prompt, which informs them that the call cannot be placed, the caller is provided with the option to leave a short video message to be delivered to the recipient. This video message can then be sent to the recipient as a Video MMS message or even an e-mail. If the caller decides that they do not wish to leave a message then a text message can be sent to the recipient informing them that someone tried calling them via a video call.

With this level of functionality, many operators believe that Call Completion provides the best solution. Call Completion completes the video call, notifies the recipient that a call has been missed and also delivers a message to them, thus stimulating call return traffic. As Call Completion makes no distinction as to the recipient's video capabilities, it treats all callers equally, enabling them to be 3G, 2G or even PC subscribers. The only intelligence that is required is for the Call Completion application to be able to handle multiple notification options based on the various types of recipients. Many operators have a large investment in MMS systems, which can handle 'legacy' messaging (MMS to SMS) and provide content adaptation, and therefore prefer to use their MMS architecture as a way of delivering Video MMS messages to their subscribers.

Call Completion is viewed by subscribers and operators as an easy to use and simple service. Furthermore, as most target subscribers prefer to use text and MMS to exchange messages, having the Call Completion service deliver a video message to their handset, rather than having to call into an application to retrieve their messages, is a large benefit.

From the operator's point of view Call Termination provides the required core functionality. Call Completion completes the call, captures the video call revenue, notifies the recipient of the call and hopefully stimulates more call or messaging traffic.

The downside for Call Completion is the fact that it is often seen as a simplified messaging platform. Many messaging purist within operators believe that this functionality should be included in a 'next generation messaging' platform that includes video mail.

On the other hand, many operators believe the simplicity of a messaging interface is an advantage as it's easy for subscribers to use. While Call Completion can be confused with video mail, it can also be justified on its own merit. The fact that it offers a video messaging delivery mechanism for 2G as well as 3G subscribers also makes this solution more appropriate for the intended market.

Benefits	Weaknesses
<ul style="list-style-type: none"> • Completes the video call • Helps stimulate call return or message return traffic • Very simple to use • Meets market requirements more accurately 	<ul style="list-style-type: none"> • Can be seen as a 'simplified' video mail solution • Potentially requires infrastructure investment in: <ul style="list-style-type: none"> ○ 3G Gateways ○ Media Servers ○ Soft switches ○ Message storage

Summary

The ability to complete video calls in an easy to use, structured and cost effective manner is a difficult issue for many operators and is influenced by many factors.

Business

Each of the solutions above has its advantages and disadvantages. However, the common disadvantage is the investment in new infrastructure, in particular the 3G gateways which convert a 3G video call to an IP video call.

Currently 2-way video calling within 3G networks are circuit switched data calls. However, as many operators are looking forward to IMS and a pure IP based network architecture, future video calls will be IP based. This therefore makes the requirement for 3G gateways a temporary one and makes the justification for such 'interim' media technology difficult.

Despite all of the solutions above being IP based, the need for 3G Gateways is currently unavoidable.

Market

The market for video calling is very new and as such there is very little historical data available to predict what the take up will be for call completion, or any associated services, might be. This, coupled with the low penetration of 3G handsets, makes the justification for further investment in video calling applications very difficult.

Furthermore, the usage patterns of potential 3G subscribers are unknown. What is known is that in the majority of operators, the targeted market for video calling is the same as the target market for SMS and MMS. For this segment, messaging is far more widely used and accepted than traditional voicemail. Secondly, the use of these messaging/data services is also being promoted heavily by virtually all network operators.

Technical

As we have discussed, some of the applications being considered, such as Video fallback to voice, are not yet technically feasible in an efficient manner. Also, the introduction of video mail introduces very complex integration or migration issues.

Furthermore we cannot ignore the investment in 3G gateways. Technically, how do you design a carrier grade solution that at a minimum has to have 1+1 redundancy, but your traffic usage statistics show that you may only require 5 or possibly 10 3G gateways ports in the initial phases of the implementation? As most 3G gateways have a minimum of 30 ports, this means you have to invest in 60 ports (30+30) for a redundant configuration, when you will only be using a fraction of the capacity. This capacity also has to be matched by the media servers processing the video calls. This makes any network design very hard to justify.

It would appear that the market requires an application which can complete the calls, stimulate call return or messaging traffic, is easy to use and preferably does not require a large infrastructure investment in elements that only have a limited shelf life.

iPoint-media Call Completion Service

iPoint-media's Call Completion solution addresses virtually all the requirements laid out above. The solution allows Video callers, including 3G subscribers, to place video calls to other video or non-video subscribers, regardless of the called party's network status. Instead of being prompted with a vague handset message, the caller is prompted with a video greeting informing why the call cannot be placed and providing the option to leave a video message. If the caller decides to leave a message, the message can be sent to the recipient as an MMS attachment together with text containing the caller's mobile number and the time and date the message was left. This means that video, and even non-video subscribers, can receive video messages (in the form of an MMS) even when they are out of 3G coverage or do not yet have a video calling capable device.

Flexible Notification

iPoint-media's solution is flexible enough to enable a variety of notification methods. Subscribers can receive notification of a video message via SMS or MMS, containing either a .jpeg or 3GPP video attachment. Messages can also be forwarded to subscribers as an e-mail, with either a .jpeg image or .wmv video attachment.

Customization

iPoint-media's Call Completion solution has been developed on a flexible and highly scalable media server. This enables easy customization of virtually all elements of the caller interface to meet the customer's specific requirements, including the Video call-flow and graphical layout.

Personalization

The solution can be designed to provide a pre-defined default message or allow subscribers to personalize their own interface by recording or selecting their own greeting message.

Security

To ensure that the solution remains secure and is only accessible to authorized subscribers, it can be integrated with many existing authentication APIs.

Scalability

All iPoint-media products and services are highly scalable. Our deployments range from just a few ports or mailboxes to hundreds and possibly thousands.

Hosted and Managed Service Solutions

In addition to Call Completion solutions, iPoint-media also provides hosting services. Utilizing an extensive network of 3G Gateways, messaging gateways and other key components, iPoint-media can deliver a variety of custom video solutions.

Housed in key locations across Europe, iPoint-media's network provides a cost effective alternative to purchasing and deploying in-house solutions. iPoint-media's hosting solutions can provide customers significantly reduced Capex and Opex, while maintaining all the resilience, capacity and security available from in-house deployments.