

White Paper: Leveraging New Technologies for IVR Applications



What IVR Developers Need to Know to Plan Their Connectivity Roadmaps

Developers of Interactive Voice Response (IVR) applications are now considering or already designing software-centric products. This stems from two independent but converging developments. The first is the growing interest of service providers and enterprises in voice-over IP (VoIP) technology; even those organizations that don't plan to implement VoIP today want solutions that will make it easy to support in the future. The second development is the ability to run voice, data, and signaling processing algorithms reliably on a host PC or servers.

This whitepaper examines these two developments in the context of their effect on IVR applications and design requirements. It provides IVR development managers with guidance on how they can best take advantage of existing technologies to ensure that their solutions are "future-proof": that they can evolve seamlessly as these two trends continue to shape the market for IVR products.

It concludes with a checklist to help IVR developers evaluate voice processing and connectivity technologies within this context.

Enterprises and Service Providers Bank On VoIP

As an IVR applications vendor, if you are not yet planning to add IP-based voice connectivity into your application design roadmaps you will be soon. While there are regional differences in the pace of VoIP adoption, the move toward "packetized voice" delivery is accelerating. It is also shaping how service providers and other organizations evaluate and choose their voice infrastructures. IP connectivity is becoming a key consideration in the selection of new enterprise communication applications.

That said, the majority of business voice connectivity today is still TDM-based. So, while most organizations may not be fork lifting entire analog and digital infrastructures in favor of IP, an increasing number are adding on new IP-based applications and planning an evolutionary path to packet-switched voice communications. In fact, traditional TDM-PBX sales have flattened today as service providers begin to bank on IP.

What's behind the growing appeal of packet-switched voice? Typically, a service provider or enterprise will choose to evolve to IP for cost savings. Some of the cost benefits include bypassing long-distance toll charges, eliminating "local long-distance" costs between offices, minimizing cabling infrastructure, and simplifying the operations and maintenance of phone systems with remote, web-based management. In this case, the business will consider a pure-IP or hybrid IP system when replacing its TDM-PBX, upgrading its data network, or changing locations.

Thus, while the practical adoption of IP telephony has been slower than initial predictions, the demand for and availability of IP is increasing. However, as IP continues to coexist with traditional TDM infrastructures, this means that IVR applications will need to interface with multiple connectivity modes (analog, digital and IP).

IVR applications will need to be able to interface with multiple connectivity modes for the foreseeable future.

Processing Power Migrates Off Board

Traditionally, IVR systems have been built on digital signal processors (DSP)-powered boards residing in PCs. Those same boards also provided the required TDM connectivity, thereby resulting in TDM-centric solutions. Major advancements in processing power are now changing how IVR vendors design their products.

This is primarily due to host-based processing, which enables IVR vendors to develop software-centric applications and products, an appealing approach because it dramatically speeds time to market and reduces delivery costs. When combined with IP connectivity, host-based processing enables a complete shift to software. In fact, an IVR product with no TDM connectivity requirement can feasibly be deployed without the previously required voice processing boards.

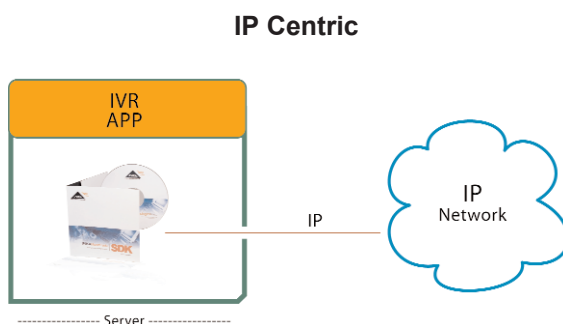
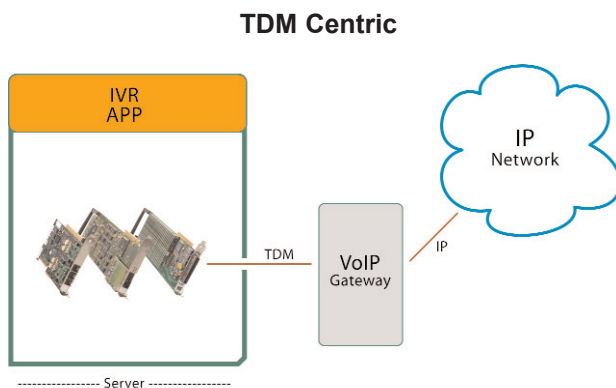
One of the greatest benefits of host-based processing is long-term scalability. Given Moore's law ¹, which predicts that computing power will double every 18 months, a host-based architecture is exceptionally future-proof. It allows vendors to develop increasingly innovative and feature-rich solutions without major incremental hardware expense. For example, the systems an IVR vendor ships today could double in port density 18 months from now, without any extra development work required. At the same time, the cost for industry standard PCs will remain constant.

Yet, the desire to develop software-centric applications is balanced with the practical reality that the need for TDM connectivity will remain for some time to come. To plan for the future while also addressing these real world needs, vendors face a variety of choices in how best to design their connectivity roadmaps.

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Planning Your IVR Connectivity Roadmap

In the long term, IVR vendors will support both IP and host-based processing at the core of their applications. In the short term, however, TDM connectivity remains a market requirement. As IVR vendors adjust their traditionally hardware-



centric applications to new connectivity requirements and the possibilities that host-based processing offers, two general approaches are feasible:

1. Utilize "bolt-on" external VoIP gateways that will coexist on racks with existing IVR products. This approach is typically considered a "quick fix" and requires few or no changes to the application. It provides a short-term solution for IVR vendors who want to stay competitive by offering IP-based features and applications. It will, however, add incremental hardware costs to the overall solution.

2. Build new IP-centric, software-based IVR applications. As opposed to the "bolt on VoIP" method described above, this approach requires that the IVR solution be re-architected. From a strategic perspective this option is best for an IVR developer's long-term roadmap because it positions the solution to seamlessly evolve with the two technology trends described earlier. It turns the traditional approach "inside out" by putting IP at the core of the system and integrated, low-cost TDM connectivity on the periphery. Over time, the quick-fix approach will result in ever-increasing costs while the IP-centric approach will mean decreasing costs.

In either case, an IVR vendor must be able to deal with multiple modes of connectivity and media processing. Applications will need to handle all possible combinations of analog, digital or IP connectivity run on either a board- or host-based platform.

¹From webopedia.com: "The observation made in 1965 by Gordon Moore, co-founder of Intel, that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented. Moore predicted that this trend would continue for the foreseeable future. In subsequent years, the pace slowed down a bit, but data density has doubled approximately every 18 months, and this is the current definition of Moore's Law, which Moore himself has blessed."

In the best-case scenario, a single solution could be deployed that allows IVR developers to seamlessly handle any or all of these possibilities without disrupting the application design. Fortunately, such technology does exist today; the following checklist will help IVR vendors to evaluate and select the most flexible and reliable voice processing solution for the market's disparate needs.

Checklist for Selecting Future-Proof Connectivity and Processing Requirements

Consider these four areas when evaluating IP-based voice connectivity and processing technologies:

Requirement: Voice Applications Expertise

TDM and packet-switched voice connectivity must coexist today. In addition, voice-processing software must be optimized for shared (host) environments. Choose a voice/fax technology vendor that can demonstrate:

- o Years of experience developing a range of voice and fax applications and processing algorithms for both DSP and host environments.
- o Successful, deployed solutions for all three connectivity modes: analog, digital and IP.
- o Intellectual property and patents in these areas.

Requirement: A Mixed Connectivity Solution

Voice expertise must go hand-in-hand with a deep understanding of mixed-connectivity environments. Look for a solution that offers:

- o A single software development kit (SDK) across all connectivity types (analog, digital and IP).
- o Backward compatibility in the programming interface.
- o Analog, digital and IP on-host. Host-based solutions that offer only IP connectivity will not provide the required flexibility for IVR vendors to exploit the time-to-market and cost benefits of host-based processing in today's reality of multiple connectivity modes.
- o Both board and boardless, host-based solutions.

Requirement: An AllOnHost Roadmap

Voice expertise must be successfully transferable to host-based processing environments. Look for:

- o Proven experience developing voice applications for non-real time environments, including both Windows and Linux operating systems.
- o An AllOnHost roadmap with a demonstrated commitment to moving functionality off the DSP and onto a variety of common hosts.

Requirement: Full Engineering Support

IVR vendors must maintain their expertise and competitive position by developing innovative IVR applications - not by becoming experts in voice. Choose a technology vendor that offers:

- o Valuable customer support throughout the design-in process.
- o Direct access to expert engineering resources.
- o A demonstrated commitment to making its customers successful.

About PIKA Technologies Inc.

PIKA Technologies' reliable media processing building blocks connect computer systems to TDM and IP networks. Brand name companies design groundbreaking IVR, call center, custom PC/IP PBX, fax and logging solutions using PIKA Technologies' components.

With two decades of experience in this industry, PIKA was one of the first media processing vendors to move voice processing onto the host, developing reliable algorithms for voice applications in shared environments. PIKA offers a single SDK across its entire product portfolio, and earned a reputation for market-leading customer and technical support. Headquartered in Ottawa, ON, Canada, PIKA has ranked in The Branham300, an authoritative ranking of successful Canadian high tech firms, for four consecutive years.



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