

# Introducing SD-VOICE for SD-WANs

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### 1. The problem with VoIP

Today, VoIP telephony is considered a legacy technology. It is barely given a second thought and along with fax and emails, low impact VoIP traffic runs between the gaps in the Cloud. *Real* applications like video streaming, CAD and Office apps define network architectures and capacity, such that VoIP is an after-thought. It sometimes claims priority but is easily squeezed out when the gaps in the Cloud close in. Is it any wonder, that VoIP garners such mixed reviews when it comes to dependability and quality of service (QoS)?

The challenge is that VoIP no longer demands a premium and SD-WAN vendors have not recognized the need to improve the quality of voice services. Quality of service and consistency are undervalued. Cell phones have “dumbed down” expectations and everyone is now trained to accept cell phone quality (or worse!) as the norm. While the PSTN was gradually improved in quality over decades to provide almost flawless service, cell phones have now lowered everyone’s expectations to what had long become an unacceptably poor standard for “plain old” telephone calls. User complaints of poor VoIP audio while all too common, seem to have been all but ignored by SD-WAN vendors to date.

VoIP when compared to cellular service is usually good, but compared to the PSTN it still falls short of expectations. When there is adequate capacity and performance IP networks are capable of supporting VoIP call quality indistinguishable from legacy land lines. While this is sometimes the case, it quite often is not. Users never know if *this* call is going to be a good one or not? As a result, serious business users still prefer land-lines because the PSTN continues to provide the most consistent and easy to use service.

Nevertheless, the move away from the PSTN to VoIP dependence is inevitable. A challenge is that quality issues do not become apparent until after the switch to VoIP has been made. Additionally, the problems are most often sporadic, making them hard to capture and diagnose. SD-VOICE can make a significant difference. It not only improves dependability of VoIP services it also provides the hooks and tools necessary to identify, understand and resolve such quality issues.

SD-VOICE is a powerful tool in a business network. Unfortunately, SD-WAN is still in its infancy and the benefits SD-WANs can bring to VoIP are not well understood. SD-VOICE can offer the IP telephony equipment and service providers a clear option. SD-VOICE offers the promise of better VoIP. This translates to clearer, more consistent audio and more dependable, resilient connections. SD-VOICE offers greater flexibility and control than even the dedicated resources of the PSTN can provide. This means that with SD-VOICE, SDWANs have the structure and capability to enhance current VoIP services well beyond the highest “toll quality” PSTN standards.

### 2. SD-VOICE: The VoIP Quality Solution for SD-WANs

Combining SD-VOICE with a SD-WAN solution provides for greater granularity of control over the quality of the VoIP voice service that is provided. For the corporate user in a hybrid IT environment this enhancement ensures the highest quality audio for each voice call. Additionally, it greatly improves the consistency and dependability of telephony service both within the enterprise and across shared public

services. With the addition of SD-Voice, users can expect seamless rapid connect times, minimal dropped calls, and greatly improved audio.

This optimized capability provided by SD-VOICE allows significant cost savings, delivering a strong ROI for the business user. It can dramatically reduce network costs by freeing up capacity and eliminating the need for MPLS links, thereby freeing up resources for other applications. Additionally, the integration of SD-VOICE with an SD-WAN platform can eliminate the costly need for a separate Integrated Services Routers in the Branch office. In summary SD-VOICE improves quality of service, reduces cost and complexity, simplifies provisioning, and increases survivability.

SD-VOICE is a virtualized sub-appliance that offers greater throughput, higher voice quality and more capability than conventional VoIP systems and equipment. The proven and widely deployed capabilities provided by SD-VOICE are underpinned with a service oriented architecture that can be easily integrated within a Software Definable Wide Area Network (SD-WAN) to provide scaleable, centralized ANP (policy-based) control and high quality IP telephony and video collaboration.

The SD-VOICE sub appliance consists of three components; a standards-based VoIP Session Border Controller (SBC), a Public Switched telephone Network (PSTN) compatible media gateway and a suite of voice-specific IP and IP WAN optimization functions.

Most businesses still rely heavily on legacy communication over the PSTN. SD-VOICE helps to orchestrate connectivity in the hybrid IT environment, and to ensure seamless operation with PSTN based legacy equipment and services.

SD-VOICE optimization functions are the key to delivering consistent, high quality VoIP. In addition to packet shaping, the primary optimization functions include unique audio compression, packet aggregation and header compression algorithms that have been proven to greatly improve voice service over VoIP systems. SD-VOICE provides the hooks necessary to react to sporadic loading or network configuration changes as well as respond rapidly to emergency situations. Most importantly, many of the SD-VOICE functions have been used by the US Military for over 20 years and are widely deployed and field proven. This unique functionality of SD-VOICE is easily implemented in today's VoIP market and provides a new level of control and data collection capability which enhances the benefit of such optimization techniques when applied to existing commercial VoIP systems, as well as to other call-based services.

The SD-VOICE enhanced platform helps to manage VoIP operations over connections where other VoIP equipment repeatedly fails. This value-add is particularly important in the branch office environment and over cellular wireless LTE data connections. Standard VoIP calls require more bandwidth to support than standard PSTN calls, (typically around 100Kbps compared to 64Kbps in each direction). With SD-VOICE technology, the required bandwidth can be dramatically reduced to under 9.5Kbps per call including the TCP/IP and Ethernet packet overhead, whilst simultaneously *improving* overall voice quality perceived by the user. Users see immediate ROI from increased call capacity and greatly improved call quality over congested networks.

In emergency networks, SD-VOICE call prioritization provides additional protection for essential services. Many unique functions provided by SD-VOICE have been certified by Verizon and Sprint for use over cellular wireless M2M Data services, extending VoIP IoT ("Internet of Things") applications beyond the normal capabilities of traditional VoIP services. These patented techniques support facsimile machines and the connection of devices containing analog modems and other legacy networking equipment.

Additional vertical markets served include brokerage (dealer boards), air traffic control, telehealth, and metering among others.

### 3. The ROI and promise of SD-VOICE

The benefits that SD-WANS can bring to VoIP are compelling, but these benefits can only be achieved when VoIP and SD-WAN work together to provide a seamless solution.

A primary function of SD-VOICE is to orchestrate connectivity in the hybrid IT environment, and to ensure seamless operation of VoIP with PSTN based legacy equipment and services. The quality of VoIP service can be inconsistent when used over economical Internet services that do not offer the protection of MPLS. Such shared public resources are subject to sporadic congestion, which can slow down call setup times and break up audio during a call if packets get delayed or discarded. As a result, Internet telephony has a reputation for inconsistency and poor audio quality.

SD-VOICE helps to maintain high quality VoIP service over congested networks. This benefit stems from a greater integration of the feedback mechanisms provided by SD-WAN when the additional optimization techniques provided by SD-VOICE are used to manage and protect the voice traffic.

Businesses always look for a quick ROI. SD-VOICE reduces dependence on expensive MPLS links by using the Internet. This results in immediate cost savings which are compelling, especially at the edge in the small/medium Branch office. This is where data rates may often be limited to one or more relatively low speed connections. Not only are the network connections used more efficiently, thereby resulting in immediate cost savings, but employee productivity is maximized when high quality telephony is ensured.

The savings generated by the integration of SD-VOICE with SD-WAN can also ensure the highest quality audio for each voice call and greatly improve the consistency and dependability of telephony service over shared public networks.

Service providers benefit from SD-VOICE because it can reduce network bandwidth and switching load (ie. the number of packets traversing the network), freeing up bandwidth on lower speed circuits, (eg. wireless links in particular) and eliminating packet congestion on high-speed backbone circuits. By integrating SD-VOICE with SD-WAN, further savings may be generated by eliminating the need for a separate ISR to handle the voice traffic. SD-VOICE reduces complexity, simplifies provisioning and enhances survivability in the branch office.

VoIP can be substantially improved with the SD-VOICE technology available today. Existing resources can be optimized to simultaneously save cost and improve quality of service. This can be the case for both PSTN compatible voice calls and High Definition voice (HD VoIP). SD-VOICE adds additional security which can be used to protect sensitive communications and provides levels of call prioritization that can be used to bolster premium services and safeguard emergency calls.

Where is the ROI with VoIP ? Often it is seen as just another "me-too" app. with little or no demand for increase in quality to PSTN standards. Now with the emergence of SD-WANS and the integration of SD-VOICE, the opportunity for a quick ROI, significant cost savings, and a measurable improvement in VoIP service can be realized.