Across the government sector, Voice over IP (VoIP) and Unified Communications and Collaboration (UC&C) technologies have never been more important. As the world becomes increasingly digital with more data available than ever before — a unique opportunity exists to transform communication and collaboration, migrating away from legacy voice.

Legacy Voice vs. VoIP

At the state and local level where budgets are tight, the push is on to streamline operations while increasing productivity. That’s why VoIP is such a popular alternative to standard voice infrastructures.

VoIP circumvents the legacy approach, requiring calls to pass through a telephone switch or a PBX. The phone side (also known as the “station”) is where users directly interface with the system. On the other end is the “trunking” structure — eliminating requirements for an operator facilitator by allowing callers to interface directly with the worldwide Public Switched Telephone Network (PSTN). This trunk path automatically aligns both primary and alternate paths for calling, dynamically switching routing to avoid connectivity delays.

Due to the complexity of typical voice networks, connectivity, performance and call quality are recurring issues. Another drawback is that PSTN is typically more limited in its scalability. As upgrades often require purchasing more hardware and dedicated lines — it becomes extremely difficult for the infrastructure to expand as demand rises. As well, PSTN services are limited in the ability to provide integration with other communication and collaboration applications. And while it’s still estimated that 66 percent of voice telephone subscribers are still actively engaged with legacy systems, these reliability issues are pushing the industry to look for something better.

As an alternative to legacy voice, VoIP is more efficient and cost-effective. Contrasting traditional PSTN, VoIP doesn’t provide connectivity between both sides of the switch. The technology mandates an IP network connection between the telephone switch and end-user devices. IP network connectivity is between the PBX and the trunk side interface to the PSTN.

Recent reports indicate a typical business can save anywhere between 50 and 75 percent by switching to VoIP. Other analysis notes landline phone systems typically cost businesses about $50 per line per month. A majority of VoIP systems can be used for less than $25 dollars per line. That’s a 50 percent savings over traditional approaches! Perhaps that’s why telcos are reportedly losing an average of 700,000 landlines per month.
Not All VoIP is Created Equal

Yet not all VoIP systems are the same. Typically, there are two types of VoIP: \textit{SIP Trunking} and \textit{Hosted VoIP}. The first type fuels \textit{VoIP on Session Initiation Protocol (SIP)} — allowing Internet Service Providers (ITSPs) to provide voice and unified communications to customers equipped with SIP-based private branch exchange (IP-PBX). Basically, a SIP trunk is a virtual version of an analog phone line. SIP trunks allow providers to connect one or multiple channels to the PBX — powering local, long-distance, and international calls over the internet. This flexibility also makes it easy to offer advanced services such as video conferencing, instant messaging, real-time collaboration and media sharing.

On the other side is \textit{Hosted VoIP}. This alternative means equipment, servers and services are hosted by the VoIP provider who manages calls and automatically routes between existing telephony systems and equipment. A hosted system means all equipment and call switching is located remotely — and on-premise technology is limited to desk phones and IP network connectivity. Users can connect from virtually anywhere on almost any device. Capital investment is low, so systems are deployed more quickly and scale rapidly.

As a cross between models, \textit{Unified Communications-as-a-Service (UCaaS)} combines the best of on-premise infrastructures and cloud. In this case, communication and collaboration applications and services are provided through a cloud-delivery model. A flexible and highly scalable approach, UCaaS powers a range of the most important technologies — such as enterprise messaging, on-line meetings, team collaboration and telephony — but only as needed. UCaaS is an end-to-end solution designed to meet the specific business requirements in an affordable, simplified and future-proofed investment. Public organizations can immediately translate agency requirements into specific technical needs with a streamlined buying experience. The solution’s single pane-of-glass powers multi-location agencies to communicate with highly centralized management across sites. The approach is also quite effective driving employee/customer engagement, while addressing compliance issues.

But which path is right for your organization — and how do you get there? Unfortunately, legacy infrastructures don’t make the choice easy.
Pushing Legacy Infrastructures

Legacy networks continue to pose one of the greatest threats to VoIP and UC&C adoption. While the shift to VoIP makes sense, governments don’t have the infrastructure in place to support it.

On the Federal side, departments are reportedly spending billions of dollars managing aging IT infrastructures. Recent analysis notes three-fourths of all government IT budgets are spent keeping legacy networks up and running. In fact, the Government Accountability Office (GAO) reports that — of the $80 billion the Federal government spends on IT systems — more than $60 billion is used for operations and maintenance.

Across state and local governments, it’s a similar story. A recent survey reports nearly two-thirds of state CIOs categorize IT systems as older and out-of-date, yet only 14 percent of state agencies are actively engaging in IT modernization processes. A quick look around states tells a similar tale:

- In Texas, the Department of Information Business Resources notes 61 percent of software supporting critical applications in its government are obsolete or inefficient.
- Colorado reports at least 50 percent of IT systems are 10 years older or more.
- Analysis in Washington State indicates more than one-third of government systems are considered legacy.

And while many government networks weren’t designed to handle the new requirements of VoIP and UC&C, successful transitions are based on more than the technology itself.

The Top 5: Best Practices for VoIP and UC&C Transformation

With the global VoIP services market expected to reach $140 billion by end of this decade, organizations must act now to align for technology adoption. And this message is coming through loud and clear across government organizations. According to IDG, almost 95 percent of government leaders surveyed report digital technology — such as smartphones, tablets, mobile apps and online services — as proven factors to spur departmental productivity.

So what’s the next step? To prepare for VoIP and UC&C, there are five highly effective strategies and best-practices we recommend organizations pursue:

Merging IT and Telephone Operations

Migration to VoIP mandates the IT department work seamlessly with the telecom operators group. While the two often operate in silos, collaboration supports integration of a data service (IP technology) into the voice services group. Taking this one step further, adoption of voice services by the IT department builds an understanding of these services, user expectations, and best implementation routes.

As always, a worthwhile first step is education. Ensuring each department fully understands the other’s objectives, teams work together to deliver on successful integrations that optimize costs. Service providers often build in these consulting and education services up-front to help initiate the process.

Know Your Bandwidth

Not every infrastructure can support VoIP. Legacy networks regularly hinder new technology adoption, making it difficult to keep pace. That’s why a full assessment of the current network is essential — determining its ability to handle additional traffic created by VoIP. This includes running network speed tests to analyze IP network capacity and judge if it can handle current and future loads. Based on this analysis, larger VoIP strategies might need to be tabled while short-term transitions are adopted. A strong service provider can help with this assessment before broader plans are implemented.
Redundancy is Critical

A trusted provider not only understands VoIP technology specifically, but relevant design characteristics across IP configurations. For example, built-in flexibility to adjust for call volume fluctuation ensures greater availability and reliability. Another example is redundant network access on premises, as well as multiple fiber/conduit runs to multiple wire centers. This allows for re-routing of IP network traffic around access circuit failures. This level of redundancy creates alternatives for networks to support disaster recovery configurations.

Setup protocols also enable failed call attempts to choose alternate pathways. IP networks can be configured for automatic response to faults and correction for service degradations. Service providers evaluate IP network designs and judge if corrective actions are possible.

As seen in the architectures in Figure 1, either can be used for the station or trunk side. The scenario used is dependent upon the provider’s network and equipment service at each customer premise location. These capabilities are especially desirable in the provider and end-user’s Point of Presence (PoP).

Another example demonstrates an alternative redundant design to avoid call failure. The diagram in Figure 2 clearly shows trunk-side connectivity for an institution-deployed IP-PBX, but the remote side demonstrates how the design works for one provided by a third-party as well. This is a particularly favorable design scenario but acceptable availability levels are still attainable if redundancy in the design is not available at all sites. Upgrades to the Local Area Network (LAN) for VoIP migration are comparable to upgrades implemented on other network segments.

On an ongoing basis, the infrastructure must be regularly evaluated to accommodate for bandwidth-intensive Web, video and voice applications. Organizations should not only build strategies for LAN upgrades — but fully expect to pursue them. Wide Area Network (WAN) upgrades are also necessary when integrating voice and data on the IP network. Management and control is even more important here, as voice traffic is real-time data that mandates Quality of Service (QoS).
Aligning with a Partner

Migrating to new voice networks is often too challenging for one organization to achieve on its own. Effective deployment often requires a partner with expertise in legacy voice and the IP network. Migrations usually run more smoothly when departments team with equipment vendors and network providers offering guidance throughout the entire migration process. Reliable providers have implemented countless migrations, and can provide insight throughout the process — identifying roadblocks before they happen.

Providers also work hard to make full use of a company’s existing IT assets. Based on past capital equipment investment, it’s critical to capitalize on legacy technology in the evolving infrastructure. The speed of migration is based on a desired return on investment timeframe, existing lease and maintenance agreements, and user populations. Organizations must work alongside equipment providers to identify back-end systems attached to the current voice system. If necessary, develop a plan to migrate these systems incrementally. Back-end systems that include reporting, fraud, and billing systems are often proprietarily tied to a vendor’s legacy voice system. With this scenario, the most cost-effective approach is not full replacement — but tapping into open source solutions during the migration process.

Every implementation is different, and successful migrations are customized to an organization’s specific requirements. That’s why choice of service provider is critical. For example, a focus on quality of service and scalability mandates detailed understanding of congestion management and control — how it plays in the provider network and the way a provider routes IP traffic.

The most ideal network service providers not only offer expertise on converged IP network infrastructures and proven legacy voice management, but also regarding scaling and managing VoIP networks. Partners can also focus on real-time management to monitor for VoIP trouble spots, such as jitter and latency. Finally, partners offering a nationwide footprint enables organizations to better route VoIP calls across a single provider network, end-to-end. This enables new levels of control, voice quality, and reliability.

Stick to the Plan

While a well thought-out migration plan is important, companies often fail to conduct ongoing testing and roll-out.

The first milestone of any partner relationship is ongoing plan creation — focusing on required technology investments and well measured ROI attached to timelines. Some things to watch:

- Scheduling and milestones for network upgrades. Test to ensure new requirements are met. This continuous testing should also be utilized before official roll-out of VoIP and UC&C to end-users.
- Integrated access devices converting between legacy voice and VoIP protocols, ensuring both technologies run in tandem during transition. This enables a manageable phased migration with back-out capabilities at every step of the way.
- Staged roll-outs are typically best. Identify a small group of end-users. Allow each to provide continuous feedback, enabling issues and updates are identified and implemented prior to larger deployment.
- Build an environment of learning, offering users access to any required information to build a strong user base. Empower users to suggest changes that drive a better end-user experience.
- Never overlook continuous assessment and analysis. Conduct periodic assessments to measure success and plan for future VoIP and UC&C deployments or network upgrades.
The Next Step

While migration from legacy voice to next-generation VoIP and UC&C is a complex and time-intensive process — the benefits are undeniable. Convenient and flexible working environments, enhanced productivity and aggressive cost savings all result from successful implementations.

But before taking the first step, be sure to team with a service provider with the technology, experience and track-record to make these migrations achievable. Aligning with a partner fully aware of individual migration needs means more effective collaboration to build and execute a strategy that works.

Are you ready to take the next step? Are you ready to take the next step? Contact CenturyLink, a leader in delivering VoIP and UC&C solutions to support your current and future business needs!

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