

# UNIFIED COMMUNICATIONS

Collaboration technologies yield staffing, productivity and budget efficiencies for agencies.

## Table of Contents

- 
- 2 Executive Summary

---

  - 2 UC Brings Benefits

---

  - 2 Convergence on the IP Network

---

  - 3 Communication and Collaboration Applications

---

  - 6 The Converged Contact Center

---

  - 7 Optimized Video Conferencing

## Executive Summary

Public-sector organizations are under continuous pressure to do more with less. The push and pull of budget limitations and service demands on government agencies continues unabated. A variety of factors, including declining revenues, budget deficits and staff reductions, feed this dynamic.

Unified communications (UC) can play a central role in enabling organizations to successfully overcome this growing disparity between expanding missions and diminishing resources. By integrating voice, e-mail, chat, video and other communication tools (and by complementing them with useful capabilities such as presence and intelligent call control), UC can dramatically improve the productivity of individuals and the organization as a whole.

This white paper outlines the attributes, requirements and benefits of UC, including:

- Data, voice and video convergence on a common IP network;
- Collaboration improvements across and beyond the organization;
- Intelligent contact centers;
- Optimized video conferencing.

Organizations that embrace UC can streamline everyday processes, better capitalize on institutional knowledge and reduce operational expenses. As a result, they can continue to expand and improve their delivery of high-value services – despite reduced budgets and limited head count.

## UC Brings Benefits

Much of the work that agencies do today is centered around knowledge work. People have to exchange information, ask and answer questions, make informed decisions and work together to fully understand and solve problems.

UC facilitates knowledge work by enabling people to interact with each other more quickly, easily and efficiently. Without UC, interpersonal communications are subject to all kinds of day-to-day inefficiencies.

Staffers leave voicemail messages for each other, possibly waiting hours for a response – even if all that's needed is a quick answer to a simple question. Meetings are delayed because of the difficulty of getting several busy people in the same room at the same time. Constituents calling into the organization for assistance become frustrated as they are bounced from one department to another.

With UC, knowledge work looks very different. Staff can quickly contact each other through whatever medium makes

the most sense at the moment – whether that's a phone call, an instant message or an e-mail.

Geographically dispersed teams can be quickly and affordably brought together using video conferencing tools and interactive whiteboards. And constituents contacting an agency can be automatically directed to the best resource available for their immediate needs.

These improvements in process efficiency and quality are especially important today. Most organizations face reduced staff and budget resources. At the same time, staff are being charged with greater responsibilities and must cope with the rising expectations of constituents who experience new value-added services from private-sector organizations. UC solutions offer just the kind of knowledge-process improvements agencies need, just when they need them most.

For all of these reasons, organizations should strongly consider adopting UC as part of their broader strategy for driving efficiencies.

## Convergence on the IP Network

A converged network serves as the foundation for UC.

To integrate the various types of communication an organization uses, they must travel over a common transport. So the convergence of data, voice and video on the IP network is essential.

At one time, organizations typically had different networks for different purposes. Voice traffic was carried over a telecom network. Data traffic between the mainframe and dumb terminals was carried over one network. Data between servers and PCs was carried over another network. And video, if it was used at all, was carried over yet another network.

The initial wave of convergence occurred when all application data was moved to a single IP-based network. The next wave of convergence occurred with the advent of Voice over IP (VoIP), adding voice traffic to the mix. In mature UC environments, convergence includes real-time video.

A single, converged network for all of these media allows voice, data and video traffic to be delivered wherever it's needed without the considerable cost of building and maintaining multiple networks. Convergence also makes it easier for IT departments to quickly perform moves, adds and changes to the network. Just as important, common transport enables implementation of UC applications that combine voice, data and video in new and effective ways.

The main challenge presented by a converged network is that each type of network traffic, voice, data and video, has different attributes. The two main attributes are tolerance and bandwidth utilization.

Data traffic tends to be fairly tolerant of latency (delays in the transport of packets over the network) and jitter (differences in the amount of delay experienced by different packets). Data traffic can also vary greatly in the amount of bandwidth it utilizes. A few small queries to a database consume very little bandwidth. Many people downloading large documents will consume a lot of bandwidth.

A downside to voice traffic is that it is relatively intolerant of latency and jitter, because it is carrying the digitized sound of a human voice in real time. On the plus side, voice traffic can be compressed so that each individual conversation consumes very little bandwidth.

Video traffic is also relatively intolerant of latency and jitter, because it carries a digitized stream of images in real time. Unlike voice, however, video streams tend to be quite bandwidth-intensive.

When multiple data, voice and video traffic streams move across a shared IP network infrastructure, the result is contention: different streams competing for the same limited network bandwidth. For example, a video conferencing session could suddenly flood the network and crowd out voice traffic, making phone calls difficult to understand.

Conversely, a sudden spike in the use of multiple data applications could create latency in video traffic that degrades the quality of the images everyone sees.

IT leaders can take the following steps to ensure that their converged networks can support both UC and non-UC applications:

- Assess the capacity and performance of the network to make sure it is capable of handling projected traffic loads, then make any necessary adjustments to proactively avoid potential problems.
- Implement Quality of Service (QoS) mechanisms to ensure that application traffic is appropriately prioritized. This protects real-time voice and video streams from the latency and jitter that undermines sound and image quality.
- Use bandwidth reservation to prevent applications that consume a lot of bandwidth (but aren't operation-critical) from crowding out mission-critical applications.
- Deploy network management tools that enable IT staff to rapidly troubleshoot performance problems and accurately plan for future needs.

To safeguard end-user productivity and keep ownership costs low, IT teams must be able to easily maintain consistently high performance on the converged IP network.

## The Unified Inbox

In addition to supporting single voicemail, a converged network can enable a unified inbox. With a unified inbox, all forms of communication — including voicemail, e-mail and fax — can be kept in a common application.

Unified inboxes provide multiple productivity advantages. They give users a single place to find all of their messages, so they don't have to keep checking multiple applications. This also makes it much easier for users to search old messages and keep them organized in folders by project or category.

In addition, unified inboxes make it easier to move from one communication medium to another. For example, a user can take the image of a received fax and forward it to another user as an e-mail attachment. The same thing can be done with a voicemail message.

This saves the sender the trouble of typing out a description of what was said in the message — and allows the recipient access to all of the nuances of meaning that might be lost in a typed description.

Along with saving time and boosting convenience, unified inboxes can greatly improve the quality with which users communicate and the effectiveness with which they respond to critical situations.

## Communication and Collaboration Applications

Because they are capable of supporting real-time voice, data and video traffic, converged networks enable implementation of a wide range of productivity-enhancing communication and collaboration applications.

One common attribute of these applications is presence. Presence is the ability to automatically detect whether a user is actively using a connected device or not. Presence-aware applications also typically give users the ability to manually change their status if they are using a connected device, but do not want to make themselves available to others at that moment because they are busy with something that demands their immediate attention.

Presence is a useful application attribute for two reasons. First, it enables application users to see if another person is either available for immediate collaboration, present but doing something else, or away. Based on that person's reported status, users can take appropriate action.

For example, if that person is available, a user can make an attempt to collaborate in real time and get a task completed quickly. On the other hand, if that person is offline completely, a user can decide to either leave a voicemail message or contact someone else who is available. Either way, presence allows users to make informed communication decisions that avoid wasted time and effort.

Second, presence enables applications to detect where any given user is at that moment. By doing so, presence-enabled applications allow users to interact with each other in real time, whether they are sitting at their office PCs, traveling with their smartphones or working at home from their notebooks. The nature of anytime/anywhere communication significantly enhances personal productivity and removes huge chunks of time from end-to-end work processes.

Several applications take advantage of network convergence, presence and related capabilities.

### Instant Messaging

Instant messaging (IM) is an extremely popular and convenient form of communication that has been broadly embraced by both individuals and organizations. With IM, users can quickly type back and forth to each other, answering questions, resolving problems, coordinating schedules and reminding each other about upcoming project deadlines.

Unlike e-mail exchanges, IM exchanges can take place very rapidly in real time. And because of presence, users know whether the person at the other end of the exchange is actually there to receive and respond to the message they just sent.

IM applications can incorporate a wide range of features to further enhance productivity. For example, users can maintain multiple lists that group their contacts by department, location, job function or other parameters.

This allows them to quickly choose the best person to contact among those who are online and immediately available. IM applications also provide file transfer capabilities that let users send each other documents instantly, without any of the delays that sometimes occur with mail servers.

Many users find IM to be especially useful while they're on the phone. For example, if two users from the same organization (but different locations) are on a conference call with colleagues, they can use IM as a "back channel" between them to communicate privately outside the broader conversation. An individual user on a regular one-to-one phone call can also use IM to quickly get information from a coworker without having to hang up, ring the colleague and then call the other person back.

These are just a few examples of how IM allows people to accomplish, with just a few keystrokes, what might otherwise require multiple phone calls, e-mail messages and much more time.

### Mobility and Mobile Voice Access

Mobile phones have changed people's expectations about communication. Many are completely accustomed to being able to talk to anyone at any time, regardless of where they happen to be at the moment.

This is obviously beneficial to an organization, because it means that staff are consistently reachable – even before they arrive at the office, after they leave or while on their way to an appointment during the day.

But a variety of problems can arise if staffers' mobile phones are not adequately integrated with an organization's phone system. What happens, for example, if someone is in the middle of a call and has to leave for an appointment? Does the staffer hang up and redial from his or her mobile phone? And what if this person has to call another location from this mobile phone? The call can become unnecessarily expensive because it uses mobile-carrier minutes instead of the free office-to-office trunk line.

Mobile Voice Access (MVA) solves these problems by allowing mobile phone users to connect to an organization's converged network and use its voice telephony capabilities just as if they were on their desktop phones. This provides several time- and cost-saving benefits.

For example, users who are out of the office can transfer a caller to a peer's extension if needed. This is the same as they would do if they were in the office, instead of having to ask the caller to hang up and dial in to the phone directory. Users can also take advantage of desktop call features such as hold and conferencing, even when they're out of the office on their mobile phones.

Users also gain the option to switch between their cell phones and their desktop phones midcall, so they don't have to reinitiate a call if they suddenly have to leave the office, or if they've just arrived and prefer the higher-quality landline.

### Single Number Reach and Single Voicemail

Related to the idea of MVA is Single Number Reach (SNR). With SNR, users no longer have to provide other people with two different numbers (one for their office and one for their mobile phone). Instead, SNR uses presence to determine which device is active – and where it should therefore direct incoming calls. This can be complemented with manual call forwarding so that users can make any phone their "active" phone at any time.

This obviously makes it much easier for callers to reach SNR users. Instead of calling one phone number, leaving a voicemail message, then trying another number and maybe leaving a second message, callers dial a single number and either connect with users or leave a message. SNR users also don't have to constantly check their voicemail out of concern that they may have missed an important call made to their "other" number.

Similarly, with single voicemail technology, users can consolidate all messages left at both their desktop phone and mobile phone in a single mailbox, allowing them to check for all of their messages in one place. This reduces the risk that an important message will be missed because it was left in the "wrong" place at the wrong time.

## Conferencing and Collaboration

A robust converged network infrastructure can also support a full range of web, voice and video conferencing capabilities, including shared PowerPoint presentations, browsing and use of interactive whiteboards. These collaborative multimedia applications allow users in multiple locations to participate in interactive virtual conferences in which they can exchange information and ideas, ask questions, and form a group consensus.

The benefits from these capabilities abound. Travel can be expensive, especially across a broad geographic distance. It can also be extremely difficult to find a time when many busy people can shift their focus from their primary responsibilities. With virtual conferencing, travel costs can be minimized or even eliminated. Worker productivity isn't lost to travel on trains, planes and automobiles.

And the multimedia tools available for virtual conferencing can actually create a more information-rich experience than a conventional meeting. This is because users can quickly access data and documents anywhere on the network or the Internet, instead of having to make sure they brought enough hard copies of the right materials for everyone attending.

Virtual meetings are also helpful for including people outside the department in conferences or seminars. Often, such people might not ordinarily be inclined to spend the money or take the time to personally attend a meeting in a distant location. But the right technology allows them to participate from their office or home.

A robust converged network running the right applications can also enable agency staffers to participate in remote meetings, distance learning programs and other useful virtual events hosted by third parties – again, without spending money or losing time for travel.

## Archiving, Governance and Compliance

Convergence and collaboration don't just help users become more productive in the present, they also help managers better govern communications across the organization over time by turning voice calls and instant messaging (IM) conversations into archived digital assets, just like e-mail.

With proper archiving, an agency can readily maintain both a record and a recording of all voice calls and IMs, or select only some portion of such communications based on appropriate criteria. This new class of digital assets can be used for all kinds of purposes.

They can be reviewed and critiqued by managers for staff training. They can be used to build more complete case management folders. They can also come into play in the event that legal or regulatory issues arise.

Organizations moving to a converged environment with multiple collaboration applications should therefore give careful consideration to these questions regarding archiving:

- What types of communication will be archived? Where will they be stored, and how long will they be retained?
- How can archiving positively influence the use of the organization's communication and collaboration resources? What guidelines should users be given about subject matter, language, etc.?
- What notifications are appropriate and required for parties to these communications?
- What constitutes appropriate or inappropriate use of archived communications by managers? How will archives be secured and protected from inappropriate use?

It is important to note that these policy issues are not new problems caused by convergence. On the contrary, every department must address how its communication resources are being used by its staff – whether or not it fully embraces convergence and collaboration.

The good thing about convergence is that it can provide managers with the tools they need to effectively archive and govern collaboration in order to optimize process quality and mitigate communication-related risk.

To derive maximum benefit from these and other collaborative applications, organizations can take several supportive actions including:

- Ensuring that the network infrastructure is capable of delivering the requisite performance for all media types

- Carefully selecting applications that individually provide the required features and functionality and integrate together to achieve potential synergies between them
- Providing users with training to make the most of application functionality
- Promoting the adoption of new applications

Organizations that successfully empower their users with these applications will consistently realize lower operating costs, higher productivity, improved services to constituents and substantial improvements in process quality.

## The Converged Contact Center

The contact center is every organization's lifeline to the outside world. It is via the contact center that agencies can answer questions, orient callers and learn about what constituents really want and need. The effectiveness and efficiency of the contact center is therefore critical to the effectiveness and efficiency of the organization as a whole.

Convergence and unified communications can play a central role in optimizing contact center performance. By managing data and voice traffic in a systematic, intelligent manner across the network to the contact center agent's desktop, organizations can gain the following useful capabilities.

**SCREEN POPS:** Using computer-telephony integration, the originating phone number of an incoming call can be associated with a customer ID – instantly populating the contact center agent's computer screen with the information needed to start handling the call. This reduces call-handling time and greatly improves the caller's experience.

**INTELLIGENT ROUTING:** By detecting the presence of specific agents, maintaining a list of their expertise and tracking the current length of call queues, intelligent call-routing applications can make sure that each call is directed to the best agent available at any given moment. This helps organizations better serve callers and make optimum use of any special skills or expertise their agents have.

**VOICE SELF-SERVICE:** By combining application features such as interactive voice response, speech recognition and speech synthesis, organizations can enable callers to retrieve data, such as account balances and due dates, by either entering numeric responses or simply speaking into their phones. This speeds up service, while greatly reducing workloads for contact-center agents.

**REMOTE-AGENT DESKTOPS:** Using technology similar to Single Number Reach and Mobile Voice Access, organizations can empower staff to work from their homes or other remote locations just as if they were sitting in the contact center.

This can extend user productivity and improve quality of life for staff. It also allows organizations to hire home-based contractors for their contact center, which can be less expensive and offer more flexibility than relying exclusively on traditional full-time workers.

**MULTICHANNEL INTERACTION:** In poorly integrated contact centers, different types of communication are often handled with different applications: one for voice calls, one for e-mail, one for live chats, etc. This can lead to poor service and operational inefficiencies, as people often use different channels at different times.

For example, someone may at first ask a question via e-mail. And then, if this person doesn't get a satisfactory reply right away, he or she will follow up with a voice call. If the contact center agent can't quickly and easily reference the earlier e-mail exchange while on that call, the conversation can become redundant and frustrating to the caller. A UC application that manages e-mail messages and calls in a common manner eliminates this kind of redundancy and caller frustration.

To choose the right set of contact center capabilities for an organization, contact center managers should consider the types of issues it has to handle and the total budget it can allocate for contact-center staff.

Agencies that have larger budgets and frequently have to handle complex queries, for example, may need to rely more on live agents. On the other hand, agencies that have tighter budgets and a high volume of simple, repetitive queries should focus more on web and voice self-service.

### The Power of Metrics

Another compelling aspect of the converged contact center is its ability to provide managers with tremendous visibility into agent activity metrics across all communication channels. These metrics allow managers to make decisions that improve service and lower costs.

For example, a manager could discover that an agent is resolving phone calls very quickly, but is very slow turning around e-mail messages. This might lead to a decision to work on improving that agent's writing skills or to have him or her handle only phone calls.

A contact manager might also discover that a new program suddenly generates a high volume of calls and e-mail. This might lead to a decision to add some content to the organization's website that better explains the issues in question – or even to make changes in the program itself, so that it is less confusing to callers. This is a win-win for the organization and the people it serves.

## Optimized Video Conferencing

Human beings are intensely visual creatures. In fact, studies indicate that anywhere from 55 percent to 93 percent of human communication occurs through facial expressions and body language, rather than through words alone. When people can see each other, in addition to hearing each other, they communicate much more effectively and form the strong social bonds that are essential to good teamwork in any organization.

This reality makes video conferencing very attractive for agencies that depend on internal and/or external collaboration. With video conferencing, staff in multiple locations can quickly and easily be brought together in meetings that include both verbal and visual communication, without having to leave their desks. What follows are some of the numerous benefits of this capability.

**IMPROVED COLLABORATION:** Video conferencing can improve both personal productivity and overall organizational performance. When people communicate more clearly with each other, they get more work done, they do it better and they do it faster.

**SCHEDULING FLEXIBILITY AND CONVENIENCE:** Staff often have difficulty scheduling meetings because they can't all physically be in the same place at the same time. By eliminating this obstacle, video conferencing makes it much easier for individuals and teams to get together sooner, rather than later.

**REDUCED TRAVEL COSTS AND DOWNTIME:** It can be very expensive to bring staff together who are miles, and sometimes oceans, away – especially when fuel costs are on the rise. Video conferencing enables organizations to dramatically reduce and even avoid associated travel costs.

**REDUCED CARBON FOOTPRINT:** Many organizations are trying to "go green," and some are operating under mandates to do so. By eliminating travel requirements, video conferencing provides agencies with a demonstrable means of reducing their carbon footprints.

**SUPPORT FOR FLEXIBLE WORK ARRANGEMENTS:** Many departments are seeking to improve the work/life balance of their staff. By offering the ability to work from home for some portion of the week, organizations hope to attract and retain a higher quality of staffer. Video conferencing supports telework and flextime programs by overcoming one of the main downsides of having staffers out of the office.

Video conferencing can enhance many aspects of organizational performance. Live, interactive training sessions, for example, can be set up for staff right at their desktops or in conference rooms at multiple locations. This kind of distance

learning can help agencies better educate staff about policies, skills and services – without the costs and logistical hassles associated with putting instructors and attendees in the same room.

Such training can also be more easily extended to contractors, partners and other third parties at remote locations. Conversely, organizations with the right video conferencing capabilities can more easily leverage training and presentations made by outside parties by piping it into their own conference rooms or to staff desktops. Video conferencing and teletraining sessions can also be recorded for later playback, so that even people who could not attend the original session can benefit from it.

## Desktop Conferencing

There are a variety of ways to provision video conferencing. The most basic approach is to provide users with a desktop camera and simple software that supports video calls, such as an IM application. Most notebooks today come with a standard

## Distance Learning

Distance learning is a special use of video conferencing and related technologies that delivers educational services to users in remote locations. While obviously of special importance to educational institutions, distance learning can also be used by government agencies and other public-sector organizations to provide instruction in critical skills, ensure understanding of regulatory mandates and prepare individuals for certifications.

Distance learning can be synchronous or asynchronous. Synchronous distance learning refers to real-time web conferencing or video conferencing sessions that permit attendees to interact live with instructors by voice or text messaging. Asynchronous distance learning refers to archived material that users access at their own convenience. With asynchronous learning, users typically interact with instructors by e-mail.

Because distance learning often requires support for more simultaneous video streams than an organization's network infrastructure and servers can handle, it may be necessary to enlist the support of a hosted streaming services provider. These organizations may still require their own video conferencing capabilities, however, so they can produce their own content and upload it to the hosting provider.

Agencies may also want to provide their distance learning instructors with UC capabilities such as Single Number Reach (SNR), single voicemail and IM so they can quickly and easily respond to questions about content, assignments and other issues.

webcam built in. In some cases, it may be useful to have a desktop microphone as well. But, for most deployments, the voice portion of the conference can be provided via a desktop or mobile phone.

Video conferencing can also be complemented with web conferencing capabilities using interactive whiteboards and PowerPoint presentations, but this may require additional software. Alternatively, hosted conferencing services bundle a variety of functions. However, the quality and cost of these services vary greatly, and their per-use pricing can prove to be expensive as organizations make more frequent use of virtual meetings.

### Conference Room Conferencing

Because the size and quality of desktop video images are somewhat limited, many agencies choose to install higher-end multimedia collaboration equipment in conference rooms at their various locations. A well-provisioned video conferencing room typically includes a high-resolution camera and a large, high-definition monitor, as well as a special-purpose microphone and speakers.

This kind of setup provides a greatly enhanced user experience. It can also often be used in conjunction with desktop video conferencing for users who cannot make it to one of the rooms.

Fully immersive telepresence facilities represent the highest end of the quality scale. These are typically used in auditoriums and conference facilities where it is important to replicate lifelike, physical presence as closely as possible.

It can be useful to complement video conferencing facilities with additional equipment, such as projectors and DVD players. These devices are often needed for presentations that feature prepackaged content such as promotional or instructional videos.

Power protection is also important for video conferencing facilities to guard against a momentary outage that forces participants to reschedule a meeting. This problem can be avoided if both the conference facility and the network that supports it are properly protected.

Every organization should implement the type of video conferencing that best suits its needs and objectives. Here are some key questions to ask:

- What does the typical monthly meeting schedule look like? Who attends these meetings, and how much does it cost to get everyone in the same room at the same time?
- What kinds of meetings would be added if cost were not an issue? What would it be worth to the agency to bring teams together more frequently and in a better way?
- What kind of ancillary content needs to be shared during meetings: PowerPoint presentations, documents and spreadsheets, interactive whiteboard activity?
- How well equipped is the network to carry video conferencing traffic? What changes, if any, would have to be made to the network to support desktop video and/or higher quality video?
- What changes, if any, would have to be made to the rooms where video conferences would be hosted? How are the lighting and acoustics in these rooms? Are the rooms located where there is little ambient noise?
- Could current IT staff provide the technical support for video conferencing if it were to be implemented? Or would a service provider have to be engaged?

Agencies that answer these questions thoughtfully and accurately can develop a rational plan for video conferencing that matches both their needs and their resources. By executing that plan, they can substantially improve collaboration across and beyond the organization – while driving down travel budgets and lost staff productivity.