

Transformative Communications Run from End to End

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INTRODUCTION

Today's modern networks incorporate an astonishing variety of interactions and communications, including not just data and voice, but also many kinds of streaming media (video, teleconferencing, chat, whiteboarding, and more). With the increasing adoption and presence of the Internet of Things (IoT), a rich collection of sensor data and monitoring information likewise needs communication and transport. All of these elements must interoperate and intercommunicate wherever and whenever they might be needed: on-premises, at remote locations and branch offices, and in the cloud (private, public, or hybrid).

Understanding Hosted Collaboration

Digital collaboration is an increasingly complex undertaking that not only involves a variety of machine-to-machine communications for typical networking and productivity applications, but a more-or-less seamless combination of text, voice, and video data sources, as well. This comprises a combination of telephony, messaging, and video often called “Unified Communications” (often abbreviated as “UC”) that permits human workers to exchange information ranging from text messages and files, to shared applications and more, in environments that may include users on phones, tablets, PCs, and other devices.

Behind the scenes, making UC work not only means coordinating and synchronizing multiple data streams and interactions—it also requires that communication work naturally, directly, and without interfering with sharing and collaboration across multiple offices or sites.

Furthermore, users of such capabilities are often widely distributed, some at company or organization offices and other sites, others out in the field, joining in via Internet connections. The dispersed nature of the user community, and the need to interact and collaborate from anywhere, at any time, explains why making collaboration work can be a real challenge.

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To accommodate such needs for more streamlined, reliable communications between employees and clients or partners, many organizations turn to cloud or hosted environments rather than continuing to leverage their in-house datacenters for UC.

The common benefits of cloud, which include lower storage costs, increased elasticity, accessibility for end users, scalability for new technology deployments, and flexibility to migrate to newer environments or extend capacity as needed, make cloud-based environments a nearly perfect fit for businesses when it comes to UC.

BASICS OF TIME-SENSITIVE COMMUNICATION

When humans interact via voice, video, or other streaming media, it’s important that such interaction occur without noticeable delays, interruptions, or signal-quality issues. Engineers refer to the kinds of factors that humans might notice (or find bothersome, if too far out of whack) using certain specific technical terms. Managing all of these closely and carefully is essential to providing a positive and productive UC environment, so these terms aren’t just specific—they’re also meaningful and impactful:

- **Latency.** This refers to the time it takes information to get from a sender to one or more receivers over a communications network. Think of latency as the total time involved in sending and receiving a message or data packet. Components of latency include propagation delay (the time it takes to move a signal from one end of a connection to the other), transmission delay (the time it takes to send a packet across a connection, including propagation delay and the size of that packet), and processing delay (the time it takes to read the packet header, queue the packet for a next transmission, and route the packet to its next destination). When sent, large amounts of data must be broken up into smaller packets for transmission; upon receipt, some reassembly of smaller packets is likewise necessary.
- **Jitter.** Jitter refers to a measurement of how much latency varies over time. Some packets may take longer to arrive than others. Too much variation (jitter) can cause pops and clicks. Jitter measures the phase shift of digital signals over some transmission medium. Like latency, jitter includes multiple components: some relate to the transmission media, others relate to transmission symbols and their characteristics.

The Keys To Great Unified Communications

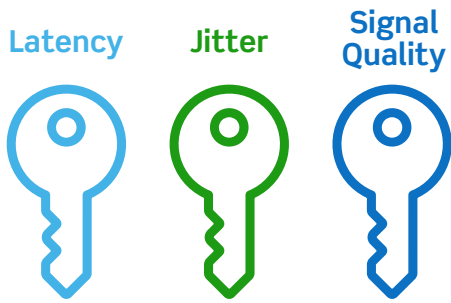


Figure 1

- **Signal quality.** Generally speaking, signal quality is a measure of how faithful and accurate the output on the receiving end of a transmission remains to the input on the sending end. There are many metrics used for communications signal quality. Consumers and providers need to use those metrics to establish what constitutes acceptable quality, and then monitor them to make sure that signal quality is met or exceeded during ongoing communications.

Latency, jitter, and signal quality matter tremendously for UC content (voice, video, streaming media, and so on) because they define characteristics that, if measured and managed properly, ensure a satisfactory and productive user experience. Thus, it's essential that these communication characteristics be understood, and related requirements for minimum acceptable levels established in advance. Only then can consumers be assured of acceptable service (or better), as all parties monitor them, and providers take the steps necessary to deliver (and document) such service.

Managing these communications metrics on modern networks can be challenging when multiple parties get involved in providing pieces of the transmission path from one end of a connection to the other. True end-to-end visibility means that one party is able to see, and manage, these characteristics all the way from sender to receiver. This avoids the finger pointing that occurs all too often when multiple communications carriers, service providers, and other parties get involved along that pathway.

True end-to-end management means that the promise of UC—namely, to improve collaboration, foster increased interaction, and improve productivity—can truly be

realized. This lets organizations concentrate on the substance and value of their communications and interactions, rather than stepping away from their core competencies to continuously work on getting communications right. And end-to-end view also supports a holistic view of security, including end users, applications, and services, plus data in motion and data at rest.

Making the Transition to Hosted Collaboration

Hosted collaboration is a method of IP-based UC that uses a client's existing IP data network to provide new and advanced communications services that generally include basic UC building blocks. The most basic blocks are voice and video, along with presence and Web collaboration, to help a client organization communicate effectively and efficiently. Clients can access UC services in the cloud through existing networks, as they transition to meet their communications metrics and service requirements.

START WITH AN INVENTORY OF THE STATUS QUO

To begin with, clients must understand their current networking and processing situations. This means taking stock of what's currently in use, from the standpoint of existing applications and services, as well as the existing network infrastructure, communications carriers, and service providers involved. This also requires that organizations thoroughly and carefully assess their current needs (as opposed to current holdings and capabilities), then define where and how they'd like their situation and capabilities to evolve to meet future needs and requirements.

This is very much an exercise in enterprise architecture and planning, so it helps to engage one or more qualified IT architects to participate, either by hiring them on, or bringing in a consultant such as InterVision, which invariably produce better outcomes.

MAKING NETWORKS UC-READY

From a networking standpoint, organizations must look closely and carefully at their current networking traffic and its performance characteristics. To ensure that UC can

deliver an acceptable user experience, organizations may have to rearrange the traffic composition on their networks, and ensure that time-sensitive traffic stays within acceptable levels for latency, jitter, and signal quality.

This usually requires a complete survey of current traffic levels and characteristics. It also means understanding that some local changes (upgrades or replacements) may be necessary to support UC applications and services. Again, this is an exercise where consulting or in-house expertise can pay off.

Along the way, an organization may choose to introduce (or manipulate) some kind of Quality of Service (QoS) or Class of Service (CoS) scheme to make sure that UC traffic provides an acceptable user experience. This also helps establish parameters for internal monitoring and management of local networks, and Service Level Agreements (SLAs) with which service providers must comply. Again, this kind of effort is essential to ensuring and delivering a productive and usable UC environment.

DEALING WITH VARIOUS LEGACIES

Many organizations will discover that at least some of their networking infrastructure needs to change and evolve to more fully and capably support UC. At the same time, the show must go on—work can't simply stop while a new UC environment is planned, designed, and rolled out.

InterVision helps organizations manage the transition, with their ability to accommodate a wide variety of legacy communications technologies while a digital transformation is underway. This includes legacy telephony infrastructures that may be built around ISDN pri/bri components, T-X (T-1, T-3, and so on) or E-X (E-1, E-3, and so on) elements, or even mainframe communications around terminal emulation (for example, 3270) or related point-to-point links and associated equipment.

InterVision has even dealt with applications and services built around paging or analog phone devices. They offer a broad range of integration services and capabilities, so existing infrastructures, applications, and services continue to function and provide value, as a modern digital transformation gets underway.

In the same vein, InterVision allows their clients to mix and match all kinds of communications technologies en route to a thoroughly modernized infrastructure. Thus, InterVision will accommodate and integrate with existing network infrastructures as they do with legacy elements also present in many organizations.

This includes support for various implementations of frame relay and ATM, as well as a broad range of IP-based networking regimes, including Multiprotocol Label Switching (MPLS), Next Generation Networks (NGNs), and most Ethernet WAN implementations including Ethernet Private Line (EPL), Ethernet Wire Services (EWS), Ethernet Relay Services (ERS), plus the whole gamut of Carrier Ethernet offerings.

GETTING FROM 'HERE & NOW' TO 'THEN & THERE'

InterVision is ready to help organizations take what they've got and incorporate UC into that mix. As described previously, this starts with an inventory of the current situation, an understanding of one's current and coming UC needs, and planning to make the transition from "here and now" to the next phase of implementation and evolution. InterVision's consultants can assist with this process at all steps along the way, but organizations should also think long and hard about adding (or enhancing) in-house IT architecture expertise to support the best and most productive use of UC tools and technologies.

Case Discussion: Transforming Digital Communications Across Sites

A look at one of InterVision's clients should help to illuminate this process of UC adoption. This organization is what's called a "downstream" oil and gas company: That means they're involved at the end of the business that starts at the refinery, and goes through the marketing and distribution of products derived from crude oil and natural gas.

The company has been in business since the mid-20th century, does billions of dollars of business annually, and services clients all over the western hemisphere. About

three years ago, the company came to InterVision with the goal of enhancing collaboration and improving productivity within the organization. They had been working into a full-on digital transformation since that time. For the sake of anonymity, let's call this company "O&G."

THE STARTING POINT, FROM AN IT PERSPECTIVE

At the time InterVision got involved, O&G worked in a largely mainframe-based processing environment. They used 56K V90 HCF (hardware-based controllerless devices, in this case) modems and conventional plain old telephone service (POTS) lines to tie together hundreds of locations with voice communications for refineries, distributors, terminals, and points of sale. Such connections are inevitably limited in bandwidth. In fact, the best-case bandwidth for such devices is 53.3 Kbps downstream/receive, and 33.6 Kbps upstream/send. Effective compression might double actual throughput, but these speeds fall below—if not well below—modern Internet access technologies from ISDN to various Ethernet services available from cable companies, telecom, and other Internet Service Providers (ISPs).

WHERE O&G IS TODAY

O&G has reworked their infrastructure to support a full range of UC, including data, voice, video, and more. They now use routers and switches that InterVision manages, operating a fully distributed IP-based network. InterVision monitors and manages that network for O&G to make sure that its latency, jitter, and signal quality metrics all fall within the range needed to deliver a positive UC user experience. The underlying network is based on a Multiprotocol Label Switching (MPLS)-based VPN and uses connectionless technology to create a single, coherent virtualized network for the entire O&G user base, across all locations.

InterVision also provides hosted collaboration capabilities so that O&G employees and partners can make use of interactive, shared voice and video applications. This includes online conferencing and web-based collaboration along with integrated text messaging/chat and file transfer capabilities. It also includes presence and follow-me capabilities so that field staff can switch between desktop and mobile devices simply and easily, through a single network login.

Under the hood, InterVision's offerings are based on their own specialized software-defined wide-area-networking (SD-WAN) facilities that have been tailored especially for the voice and video aspects of UC. This enables InterVision to provide and manage carrier-grade services across AT&T's network, without requiring O&G to interact with AT&T at all (InterVision provides all contact, support, and billing directly to O&G itself).

THE 'CO-MANAGED MODEL'

InterVision's approach to managed collaboration hosting means that O&G's small IT staff works directly with them. InterVision calls this approach a "co-managed model," which is meant to describe a situation in which all parties see all network management dashboards and information. Though O&G IT staff doesn't have the same level of privileges that InterVision's administrators wield, O&G staffers can see and drill down into all of the status, monitoring, and troubleshooting dashboards that InterVision uses to deliver the O&G hosted network and its UC services.

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The view that InterVision provides to O&G—and uses themselves—can truly be described as "end-to-end." All parties can see each LAN segment to which the managed switches and routers are attached. They can see (all parties) and manage (InterVision only) all switches and routers, including traffic characterization, policy information, and SLA compliance data. Ongoing metrics report on latency, jitter, and signal-quality characteristics for all the WAN links that tie the various switches and routers together. Thus, all parties see and can work from a global, holistic view of the entire O&G network at any time.

In addition to these dashboards, InterVision also provides periodic reports to O&G IT staff and management.

They worked with O&G to define a standard battery of reports, with specifications as to how often (and what) gets delivered to O&G's management servers. In addition, InterVision works occasionally with O&G to provide customized reports and one-off data breakouts to meet specific company needs.

Thus, for example, InterVision has helped to produce reports to correlate outlays for online sales meetings with revenues and earnings realized (as a rough measure of sales productivity). They've also produced department and organizational-unit level correlations for UC costs and distributed revenue/earnings figures, to help assess UC's internal effectiveness at O&G. According to O&G management, previous reports have eased any concerns they may have had about ROI. Indeed, this has encouraged them to look for more and better ways to make future use of UC within the organization.

The Real InterVision Advantage

What worked for O&G can work for you. Why? First and foremost, InterVision offers true end-to-end services delivery, a single vendor to interact with. They can provide a managed presence on as many locations as needed or wanted, and provide seamless UC-ready infrastructure and services to match. They purchase carrier services from all the major players in the North American market, including AT&T, so there's no need to change allegiances to bring InterVision into the picture. And because InterVision offers integration with legacy communications links and technologies, it can offer companies an easy way to bridge the transition from the current circumstances—whatever they may be—into a modern, UC-ready, full-blown digital transformation.

For organizations with lots of locations, InterVision has the relationships necessary to bring them all together under a single coherent network umbrella. They have direct, peering-level access at 60 to 100 sites around North America. They also act as a competitive local exchange carrier (CLEC), which means they can compete with other CLECs, as well as the incumbent major carriers. This makes them uniquely well-positioned to tackle projects with challenging legacy elements, including various takes on telephony-based or mainframe-based communications

that include everything from low-speed POTS lines and terminal drops to ATM/SONET and Carrier Ethernet.

With its express-tailored collaboration hosting capabilities that focus on UC, InterVision offers all the benefits of hosted voice services to clients. Those same clients can elect whatever kinds of advanced video, collaboration, and streaming options they may wish to include in their service package, as well. All this comes in a customizable, pay-as-you-go, demand-driven form, so clients can get as much capability and capacity as they wish to use.

Working with large carriers can be a burden for some organizations: too often, this adds both cost and complexity to requirements for doing business. InterVision seeks to shield its clients from such costs and complexities, and acts as an intermediary to the large carriers its clients wish to use. When your organization does business with InterVision, you get a single bill that covers all costs and services. You also get a single point of contact for support, consulting, and troubleshooting. When things go sideways, as they sometimes will, InterVision is there to help you pick up the pieces and get back to work. No finger pointing, ever!

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Under the hood, InterVision's Hosted Collaboration leverages Cisco-based collaboration tools (Unified Communications) to boost voice, messaging, and video capabilities. With InterVision to provide support and training, your IT department can escape the time-consuming and never-ending work involved in phone system support. InterVision is a Cisco Gold Partner—the highest level of partner recognition for Cisco. Thus, InterVision brings knowledge of Cisco Unified Communications that's both broad and deep to all its clients.

InterVision's partnership brings the powerful advantages of Cisco into your operations, allowing you to do anything—and more—that's possible with on-premises Cisco. You can incorporate the robustness of Cisco-based collaboration tools to increase voice, messaging, and video capabilities for truly Unified Communications.

Cisco is one of the most recognized and trusted names in the industry, and InterVision's partnership leverages that expertise to the hilt. From planning and design, to installation and deployment, to managing growing infrastructures and services across the entire lifecycle, InterVision does it all.

AT&T PARTNER EXCHANGE PROGRAM: INTERVISION IS PLATINUM ELITE

As a top-tier member of AT&T's Partner Exchange program, InterVision's clients benefit from InterVision's ability to offer AT&T products directly to them. For added convenience, the company regularly bundles them along with managed services (such as collaborative hosting). InterVision's Network Operations Center (NOC) acts as the first and only point of client contact for any AT&T-based products or circuits. Two key offerings include:

- **Internet Bandwidth:** Dedicated Internet connections across a range of bandwidths from 2MB to 40GB+
- **AT&T VPN:** Secure networking solutions for corporate information access across locations, among business partners, via cloud providers with support for mobile workers via Internet links.

InterVision's status as a Platinum Elite member gains its clients access to pricing that's generally lower than what's available through AT&T direct sales. In many cases, InterVision can boost bandwidth levels above what AT&T offers, and still come out ahead against AT&T direct. Because AT&T is competitive with other carriers, this advantage extends to its offerings, as well.

One of the biggest benefits from InterVision's Platinum Elite status is that the company can bill on the behalf of AT&T (as well as other parties that may be involved in a client's market basket of services and connectivity). Instead of dealing with multiple bills (and multiple billing organizations, formats, and processes), InterVision's clients get a single bill that includes all elements—

including InterVision managed services—in one simple, easy-to-understand statement.

InterVision's NOC offers first-call response for AT&T circuits and products, which it monitors 24x7x365. In many cases InterVision will identify and fix a problem before clients notice it's there.

And, finally, InterVision's expert technical staff handles its clients' network infrastructure and managed services needs, including AT&T circuits and products. The company can integrate AT&T elements into load balancing, firewalls, switches, routers, and other infrastructure elements (including SD-WAN).

MOVE CONFIDENTLY TO THE CLOUD

InterVision helps clients transition to secure hosted voice and collaboration solutions. It offers planning, design, and deployment expertise—including a strong knowledge of best IT architecture practices and processes—to help its clients make the most of their digital transition and technology investments. From pagers, to analog phone components, to mainframe terminal drops, InterVision will help bring legacy IT infrastructure up to snuff, and into the cloud.

InterVision also helps IT departments document and justify the costs involved in transitioning to hosted services. It provides detailed total cost of ownership (TCO) analyses to its clients, who can use them to explain and show the benefits of such solutions. The company has observed that

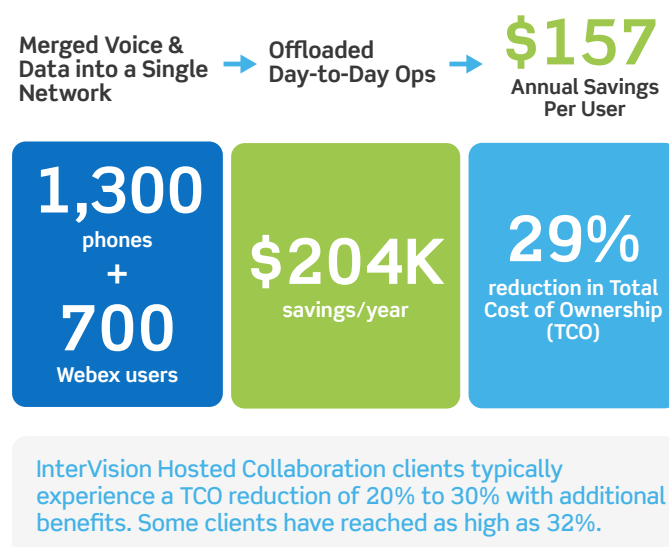


Figure 2

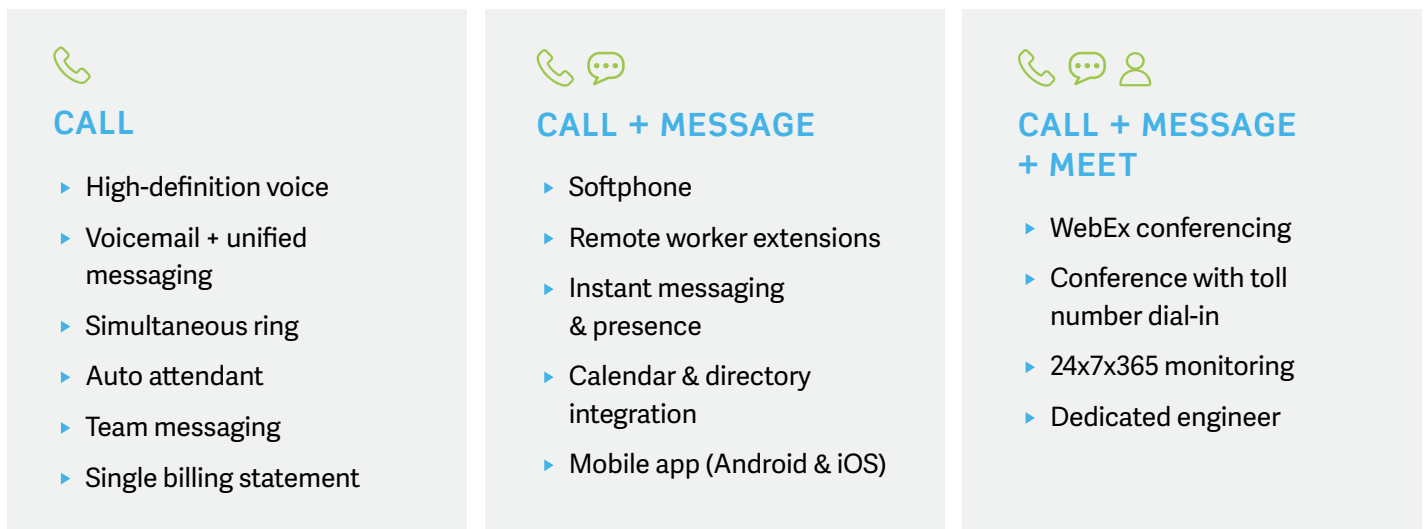


Figure 3: InterVision's Various Hosted Collaboration Offerings

most clients lower their TCO by somewhere between 20% and 30% when they combine voice/collaboration/video (UC) services with the full stack of network, infrastructure, and applications managed through InterVision's own audited and resilient datacenters (fully compliant with SOC 2 standards and requirements).

Best of all, a partnership with InterVision provides safe, secure, and future-proof access to technology. It offers a full suite of cloud-based services and capabilities, including entire virtual infrastructures (Infrastructure as a Service) suitable for deployments at the largest scales.

With InterVision involved, anything that goes on in the datacenter also goes safely and securely into the cloud. **Figure 3** lists InterVision's various hosted collaboration offerings.

InterVision also offers an outstanding "market basket" of customizations it can add to its hosted collaboration offerings. These include:

- ▶ Contact Center
- ▶ Emergency Response
- ▶ Emergency Notification
- ▶ Quality Management Scorecards
- ▶ Call Reporting & Analytics
- ▶ Screen Capture
- ▶ Call Recording
- ▶ Audio Paging
- ▶ Attendant Console
- ▶ Fax
- ▶ Speech Analytics

InterVision makes it easy to collaborate anywhere, anytime. UC is available in all three subscription models shown in **Figure 3**, so clients can choose the services they want, and pay as they go as they consume those services. Additional packages or customizations may be added on demand, so clients may grow when and as they like.

Speak with an InterVision Expert

As a leading strategic services provider (SSP), InterVision assists businesses in driving value and gaining a competitive edge by helping IT leaders solve the three most crucial challenges they face:

- **Right Technology:** What is the best technology to solve my unique problems?
- **Right Premises:** Where do I put my workloads?
- **Right Model:** What is the right resource model to enable my team's success, now and in the future?

To learn more about [InterVision's](#) hosted collaboration and carrier services offerings, please visit the company's [Hosted Collaboration](#) and [Cloud Services](#) webpages, or [reach out to InterVision directly](#) for a conversation.