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VNCI and The Changing Role of Connected Video

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Management Summary

When you get a camera, you usually take pictures of yourself and your friends. Similarly, the first reaction of many companies to video capabilities was to think about implementing videoconferencing. This portraiture use of the video feed has been the next wave of the future for some thirty years, but has yet to become compelling for most enterprises. Videoconferencing has a few demonstrable and measurable advantages over audio-conferencing, but too many demonstrable points of pain, including the expense of deployment and, for those systems using data networks, a number of bandwidth issues. Many implementations are one-way or limited in their interactivity. As with a camera, video technology gets very useful once you've fooled with it a while to figure out where it can make a difference. The good news is that the uses of a remote video feed go far beyond videoconferencing, and this is where the most immediate and tangible benefits are to be found. That videoconferencing is also enabled is a fringe benefit.

One of the revolutions at the end of the 20th century was the variety of new data capture capabilities that became possible from remote-controlled cameras and sophisticated sensors, facilitated by markers such as barcodes. Certain industries quickly figured out how to use the new data capture capabilities to change and optimize business processes. The transportation industry is perhaps the most obvious example, where electronically enabled content tracking has gone beyond improving fleet efficiencies to evolving and optimizing the way business inventories and supply chains work.

Remote imaging is a revolutionary technology, in that it allows people to do things they couldn't do before. It allows them to see and analyze places and things they cannot easily get to, from the plains of Mars to the interior of the human brain. It allows them to non-intrusively monitor people, places and complex environments, which may enable reality-based policy development in areas like the environment and security. The virtues of video go beyond the bounds of human sight, for a rich media feed of uncompressed video and sensor data can enable extensive analysis. An astronomer seldom looks through an optical telescope any more, for human eyes cannot absorb the star spectra as well as electronics, and cannot process what is seen as well as computers. Revolutionary thinking comes from such direct feeds of information and experience, not from spreadsheets and spin. Access to rich media information can change, and accelerate, how advances are made in engineering, medicine and communications.

In many of these situations, the timeliness, quality and location of information delivery are crucial. A doctor wants another opinion in the middle of a delicate operation. Geographically dispersed aeronautical engineers want to compare analyses of a test rocket flight. All have needs for massively bandwidth-intensive, uncompressed video feeds which cannot be met by streaming technology, and which would likely swamp most enterprise networks. At the same time, the participants also need access to their computer application tools – and they need to talk to, and perhaps see, each other.

One company, VNCI, stands ready to deliver this information, using campus phone lines at a different frequency to avoid conflicting with either phone or data (modem/fax) traffic. Their VidPhone system solves the problem now, and does not depend on future bandwidth for full and economical implementation. The company's early customers represent a variety of businesses, which have found in video a tool that gives them a unique advantage. For more details, read on.

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The Problem

Most media streaming works over data networks[1], which, with current bandwidth constraints and security concerns, may not always be an appropriate solution. Many enterprises want to have their cake and eat it too. They want a private network solution with the full richness of uncompressed video, the ability of participants to access the full application set of their workstation during the videoconference, and the ability to achieve this without using (or impacting) the LAN or WAN. Video Network Communications, Inc. (VNCI) of Portsmouth, NH, has an answer, which uses a patented method to transmit uncompressed video over Category 3 or 5 PBX phone lines (digital or analog) without interfering with phone service or being affected by the lack thereof, should telephone service go down. It can transport both live and stored sources locally and globally.

The Technology

VNCI's method uses a switch (the VidSwitch) that transmits the signal at a different frequency than that used by phone systems. If the transmission extends beyond the enterprise campus, it comes in over ATM (the best for uncompressed video), IP or ISDN to the VidSwitch that routes it over the phone lines to the user. There, a VidModem strips off the video and audio feeds and passes on the normal phone traffic. The audio and video feeds can plug into a television or the desktop computer through its existing multimedia interface software or, lacking that, an overlay card, either a video overlay card or USB-based overlays from vendors like ATI. The feed appears on the monitor as an icon or a window. Behind that icon is a highly customizable directory of the different feeds available to the client and client-preference options. There is some Java software running on the desktop but no video load on its processor because the feeds are pushed from the VNCI switch. The client Java-based platform can work with any client (within reason)[2]. The VNCI system can use existing media capabilities on the desktop or can be wired to a conference room. VNCI can provide a camera appropriate for either location. The video feed bypasses the LAN, which means it causes no bandwidth issues and is not subject to hacking. There is nothing in the video delivery system to interfere with the applications the user needs to analyze and explore what he/she is seeing on the video feed. VNCI's system supports up to four inputs for multi-way conferencing. It can expand beyond four with an external bridging service.

Beyond the Campus

For global implementations, VNCI's system uses gateways that sit outside the organization's firewalls. IP, ISDN or ATM can be used. The video is compressed at the gateway (outside the firewall) and decompressed at the switch, not at the desktop. When using ATM, VNCI usually uses switched virtual circuits, the bandwidth of which can be reallocated when not in use. Permanent virtual circuits can be allocated for critical feeds.[3]

Traditionally, video is transmitted via ISDN, and streams bi-directionally from the control box to the endpoint. If the connection is down, there is no recourse. Using phone lines gives you more flexibility. The switch features hunt group capabilities to automatically retry various pathing options when necessary.

Pricing

VNCI takes a custom approach for each job. The cost of VNCI's video solution varies with each situation, but ballparks at $1-5K/endpoint, based upon five or more endpoints. As the market matures, so will pricing models. Cable companies are now hampered by the economic need to under-provision (or oversubscribe) nodes and the unwillingness to add potential bandwidth hogs into their more decorous residential and constrained commercial customer bases. Other video-conferencing approaches stream over data networks, and are targeted at different, lower quality video feed markets. **VNCI is for those for whom high quality video is functionally necessary. It is there that they deliver – today – a solution that will fill the bill for many customers.**

VNCI Customer Deployments

Early adopters of VNCI's technology have been in government, education, health care, video production and broadcasting, and financial markets. A quick look at a few of their customers will reveal the value of their approach. In each of the following customer examples, the need for video was intrinsic to the business process and was

[1] Local Area Network (LAN) or Wide Area Network (WAN).

[2] Client requirements are a 400 MHz or faster Intel compatible processor. Operating systems supported include Windows (95 or later), Macintosh (OS 8.1 or later), Sun (OS 2.7 and higher), SGI (IRIX 6.5 or higher) and Linux (Red Hat 7.1 or 7.2)

[3] Private Virtual Circuits (PVCs) are permanent bandwidth allocations. Switched Virtual Circuits (SVCs) are temporary and more complicated to deploy, but more flexible.

critical. In each case, VNCI filled the needs for high video quality and low intrusion on existing data systems.

The Lahey Clinic

Digitization has caused an inflection point in how medicine does business. With the digitization of data capture devices (from surgical scopes to x-ray images), there is now the technical capability to transmit a variety of relevant information to and from the operating room in a way that does not compromise sterile conditions. Because much of this information is graphic in nature, video is entailed.

The Lahey Clinic wanted to enable collaboration, training and access to clinical expertise, both within the institution and with remote institutions, and chose VNCI for their visual network. The VNCI network enables real-time broadcast of surgical procedures and two-way video communications for consultation between Lahey's operating rooms, research labs, training facilities, and conference rooms. "The possibilities with this system are limitless, not only for Lahey but for the entire medical community," said Dr. Paresh Shah.

U.S. Naval Air (NAVAIR) Systems Command

As communities have become more sensitive to what goes on within their borders, NAVAIR has centralized its testing operations. Blowing things up is an inherent part of developing defense systems, and the Navy Labs in the middle of a desert at China Lake, California[4], is one of the places you can do it. Many cameras and sensors capture the data from each explosion and transmit over a high bandwidth (video up to 15.4 Mb)[5] ATM network connecting the labs across the country. Using the existing secure ATM network for video transmission saved money and promoted security.

The tests are transmitted over VNCI Switched Virtual Circuits, which can multicast to thousands. At the time of the event, personnel can simultaneously dial in to a particular camera feed, collaborate, and run simulations and design applications. After the event, scientists can call each other (point-to-point) to discuss what happened while calling up simulations on their workstations to test alternative scenarios.

The VNCI solution enables one of the first implementations of the Navy's Network Centric Warfare vision. Network centric warfare is based on the ability to get the right information to the right people wherever they are. "[The VNCI System] will not only reduce project life cycles, it will allow us to utilize personnel and facilities based on expertise, not geography," said Mark Collstoe of Navy Air Warfare.

Turner Studios and Canadian Broadcast Corporation

Turner Studios had been retrieving their digital video by coaxial cable (one way and limited), copying it onto tape and transporting it physically to where it was needed (since streamed quality would not do). Since this process involved over 40 editing sites, it was a cumbersome process. What Turner specifically needed was an uncompressed video transmission capability for collaborative editing and for executive approval. VNCI gave them what they needed over the copper wiring they already had installed. "VNCI's technology dramatically streamlines the collaboration process between executives, producers, and clients," said Dan Darling of Turner Production Studios.

At another broadcasting installation, Canadian Broadcasting Corp is doing their real-time closed captioning using VNCI-enabled video terminals. The need to accomplish closed captioning in real time demands the immediacy of something other than the cache-enabled technology of traditional video streaming. VNCI's phone line-based technology was the answer.

In each of these customer examples, the need for video was intrinsic to the business process and was critical. In each case, VNCI filled the needs for high video quality and low intrusion on existing data systems.

Conclusion

VNCI's customers have been in situations where there is an immediate and compelling need for high quality access to rich media information, including video. As all companies reassess what they do and how they do it, the availability of rich media solutions may allow them to expand what they do, or to use rich media to avoid previous limiting factors to their operations. Together with collaborative capabilities and the increasingly sophisticated analytical tools of business intelligence, access to rich media is a catalyst for new methods of productive creativity.

[4] The China Lake facility is bigger than Rhode Island and has no local civilian population.

[5] While humans can't tell the difference beyond 6-7 megabits, the extra bandwidth enables computer analysis.

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