



## **OFF-NET VIDEO TECHNOLOGY ALLOWS FOR HIGH LEVEL OF COLLABORATION, COOPERATION**

*Medical Applications Provides Opportunities for Life-Saving Consultation*

It almost sounds like a riddle, or a brain teaser that you would tell at a party: How can two surgeons reside on opposite sides of the country yet operate on the same patient?

The answer – off-net - isn't particularly tricky or funny, but it's real. Imagine this scenario: one surgeon is on the East Coast performing a risky operation, while a colleague is on the West Coast watching the procedure on video, acting as a "consultant." If a complication were to arise, the connection between the two surgeons would allow for real-time collaboration.

Increasingly, off-net video ("net" referring to Intranet, "off" meaning off the Intranet) is being utilized by medical personnel for this and similar situations. The medical field, in fact, is a prime mover in this area of technology: for the last few years, there has been a clamor for an off-net solution for hospitals and physicians to stream video content out on the Internet, allowing them to provide tutorials and lectures, much like a virtual classroom. In major healthcare institutions, video is increasingly becoming an essential element for improved patient care, as well as physician training and collaboration. What's more, a doctor who might have privileges at multiple hospitals could be at Hospital A on Monday, but still consult on a surgery at Hospital B.

The foundation of off-net video - on-net video - is a fairly complex technology. The quality of service is always maintained even in the presence of network congestion; the video is always high quality, and timeliness of video packet delivery is ensured. Basically the application of off-net video is to extend the accessibility of streaming video by broadcasting it to the internet so it can be available anywhere.

While it sounds quite similar to videoconferencing, an off-net video application has notable advantages. Certainly, videoconferencing has a variety of uses, since it virtually transports participants to the scene of the action and creates a sense of local presence. What's more, with most companies' travel budgets being dramatically reduced in these lean economic times, videoconferencing provides a perfect alternative. Situations where videoconferencing works well include damage assessment; disaster recovery; monitoring hazardous or dangerous areas; scientific collaboration; and general communication with isolated work teams.

However, in a surgical application as described earlier, high resolution and clarity is paramount to ensure that a consulting physician is 100 percent sure about exactly what he or she is viewing. Videoconferencing does not provide this level of resolution, nor does it need to, given its typically non-critical applications. With an off-net video solution, there is minimal disruption in video quality, a critical consideration when a person's life may literally hang in the balance.

Of course, there are myriad instances where clarity and high resolution are essential for accurate and effective two-way communication (e.g., various military applications). In any such scenario, an off-net video approach is ideal. Additional

applications for video off-net are diverse, ranging from education to any project where collaboration is required between two or more parties; it can be established like a student/teacher relationship, where there are multiple “students” receiving some type of instruction. In a medical school application, it is particularly useful, in which a teacher can review standard surgeries which were previously recorded.

Sometimes, in an instructional situation, the small viewing area for the surgery makes off-net video a necessity. Consider an arthroscopic procedure on a patient’s knee: it is not practical or realistic for 10 medical students to stand above in an observation gallery and expect that they will be able to see the operation clearly enough to take intelligent notes. The only way to see what is going on is through a fiber optic video camera. Hence distributing high quality video is critical - real time in some cases, other times from an archive for both collaborative and educational purposes.

MapleWorks Technology, a leader in software development outsourcing solutions and services for the data and video convergence, network communications and telecommunications industries, is quite familiar with this technology, particularly as it applies to medical usage. MapleWorks’ expertise was enlisted by a company that enables medical, government and enterprise customers to flawlessly transport high-bandwidth, and real-time mission-critical applications over existing IP networks - anywhere, anytime.

The client has considered 17 other companies for the project, but ultimately settled on MapleWorks based on a variety of criteria.

“Our technical expertise, along with our close proximity to the customer, was the primary considerations,” said Peter Maly, the MapleWorks’ Software Development Lead/Architect for the project. “What’s more, we were the only ones able to deliver everything in the time frame the customer had outlined.

“Certainly, as an outsourcer, we can’t compete with India or China purely on labor cost,” he added. “But dealing with an offshore outsourcer carries hidden costs that would show themselves later in the project. Plus, as I mentioned, our technical acumen is second to none.”

The company approached MapleWorks because it was faced with some near-term product development efforts that were going to exhaust the company’s ability to develop all the needed features for its product portfolio. To remedy the situation, the company decided to augment its development staff with an engineering services outsourcer that could quickly work side by side with the company’s engineering team. More specifically, the company contracted with MapleWorks to jointly create a streaming video service for medical video applications that could be seamlessly integrated into the company’s existing product portfolio. MapleWorks first came together with the client in July 2008 and the partnership was officially kicked off in November 2008. Even though this project went through the RFP process, engaging within just 3 months, it is a testament to MapleWorks’s ability to work through the process, minimize contract talks, and get down to business of development.

The project was intended to provide the client with a much-needed addition to its product offerings. The client’s applications were currently used to transport, archive and access HD medical-grade video throughout the hospital campus over its existing IP

infrastructure. The product MapleWorks was to deliver was an off-net video solution to stream high definition (720p) video over the Internet, using H.264 codecs to minimize bandwidth consumption and maximize video quality. The solution had to be integrated into the customer's existing Active Directory or LDAP infrastructure, in order to provide Single Sign On authentication and authorization for the off-net solution.

The client's GUI was made with Adobe FLEX to meet the high expectations of a user-friendly experience. The company also employed Java J2EE technologies, along with Spring Core and Security frameworks, to create the off-net solution, and to interface with the on-net solution.

An H.264 encoder technology was used because it yields high-quality video at a comparable lower bit rate, a critical element since not every potential customer possesses 100-megabit Internet connection. The resulting deliverable was an off-net video product that was straightforward and easy to use (if doctors were going to be intimidated by the complexity of the system they simply were not going to use it), yet one that offered a very rich user experience.

MapleWorks also employed an Agile software process, allowing them to build out portions of the product and subsequently present them to the customer to ensure they were on the right development track. Once each portion was approved, a new portion was undertaken and the process began anew.

The time frame on this project was extremely short - about 18 weeks of development for a team of five. "It was a difficult challenge but an achievable one", said Maly.

“The client really needed this project to be completed quickly. The fact is, many of its competitors had already developed off-net video products and were actively marketing them. This effort was going to help them catch up and, in fact, surpass the competition with an off-net video product that was not only more functional, but less expensive to deliver.”

On that score, one would have to conclude, “Mission Accomplished.” In fact, using MapleWorks’ solution as a springboard, the client will soon be offering an off-net video product that will, arguably, become the industry standard.

The client has undoubtedly used MapleWorks’ expertise – and the power of off-net video – to provide its medical clients with a highly functional application. So where does off-net video go from here? How much further can “state of the art” be pushed?

“I don’t know how much more we can do to increase video quality,” said Maly. “It’s hard to imagine video quality getting much better and maintaining or lowering its bandwidth consumption. However, I do see that there will be more applications being discovered for the technology. Considering the high-quality, high-resolution video that this technology is providing, there will no doubt be greater uses for it that we haven’t even envisioned yet.”

###