

## School District Provides Remote Communications Around the World

Paradise Valley Unified School District uses Cisco TelePresence to offer real-time communications with international resources.



### Business Challenge

EXECUTIVE SUMMARY
<p><b>PARADISE VALLEY UNIFIED SCHOOL DISTRICT</b></p> <ul style="list-style-type: none"> <li>• K-12 Education</li> <li>• Phoenix, Arizona USA</li> <li>• 34,000 Students</li> <li>• 3,000 Staff</li> </ul>
<p><b>BUSINESS CHALLENGE</b></p> <ul style="list-style-type: none"> <li>• Advance pedagogy and success of remote learning and communication</li> <li>• Deliver innate human expressions and experiences in remote communication</li> </ul>
<p><b>NETWORK SOLUTION</b></p> <ul style="list-style-type: none"> <li>• Use multiple video cameras and high-definition screens for online learning and communication</li> <li>• Share video and conduction of electronic dialogue</li> <li>• Leverage Microwave Wireless Wide Area Network (WWAN) broadcast and districtwide telecommunications convergence on Voice Over Internet Protocol (VoIP) system</li> </ul>
<p><b>BUSINESS RESULTS</b></p> <ul style="list-style-type: none"> <li>• Delivered, individualized, and supported learning for all students, regardless of physical boundaries</li> <li>• Connected with national and international post-secondary institutions for recruitment efforts, guest lectures, and more</li> <li>• Created cost-effective, remote classrooms</li> </ul>

Paradise Valley Unified School District (PVUSD) spans approximately 98 square miles in the northeastern area of Phoenix, Arizona. Over 34,000 students and approximately 3000 staff, which includes teachers, staff and administrators, are spread throughout 31 elementary schools, 7 middle schools, 5 high schools, and a variety of specialty schools, making PVUSD the fourth-largest school district in the state in number of schools and the seventh-largest in terms of student population.

“Our mission is to cultivate, lead, and inspire world-class, innovative thinkers and expert communicators through a focus on the relationship between educator and student built around challenging and engaging curriculum,” says Jeff Billings, director of information technology, PVUSD. “We are blessed with having a community that is fully supportive of this mission and has made certain decisions that allow us to incorporate technology into the learning space. For example, the district community has dedicated a percentage of the property tax, in addition to state funding, to procure technology for our students.”

In 2000, Billings and his team upgraded the District’s core infrastructure to Cisco® products, laying the network foundation to implement future advanced technologies as they became available. This decision, paired with the Internet’s growing domination on global communication, led district officials to explore unique, collaborative ways to integrate technology into classrooms. “PVUSD recognizes that cultivating world-class thinkers requires educators to go beyond teaching students

how to read, write and do equations,” Billings says. “Students must also be prepared for the worldwide transitions taking place in communication, technology and culture.”

A pivotal point came in 2009 when the State of Arizona approved legislation allowing districts to apply for enrollment funding for online learning programs. “After extensive research, Cisco’s TelePresence solution was one of the best online, face-to-face conference technologies we ever experienced,” says Billings. “We began to understand how it could improve our operations, bring value to classroom learning experiences, and connect PVUSD to the world.”

**Figure 1.** *The Cisco TelePresence technology allows participants miles apart to feel like they are in the same room.*



### **Network Solution**

Although existing video conferencing systems allow end-users to see and hear each other, the design is not based on natural human interaction. Low-definition hampers their success. Due to poor audio quality, bad image resolution, and small picture size, there is usually no sense of being in the same room with other participants. Additionally, eye-to-eye contact is commonly absent from frequently misplaced cameras.

The Cisco TelePresence™ solution is the next level in video conferencing, because it uses multiple video cameras and high-definition screens to connect people at different locations. As such, students and educators can see one another while viewing shared video and/or conducting electronic dialogue.

In October 2009, PVUSD began the installation of seven Cisco TelePresence System 500s (one at each of the five high schools, one at the pvONLINE center, and one at the Technology Operations Center). Cisco Unified Videoconferencing 3515 Multi Control Unit (MCU), and Cisco Unified Border Element (CUBE) with Cisco Unified Communications Manager (CUCM) were also deployed at this time. Network Infrastructure Corporation (NIC), a Cisco partner, was instrumental in providing support for the integration of TelePresence into the district’s previously installed Cisco infrastructure. “NIC served PVUSD by laying the foundation for future IP systems through the

integration of Cisco's Unified Communications. With this system in place and the District's increased need for communication and specialized lesson plans, the next step was TelePresence to allow students the access to learning environments that would not have been possible otherwise. This solution has helped open the doors for PVUSD and is changing the face of education in the State," says Brent Graves, senior account manager for NIC.

"Our TelePresence implementation was a long and arduous road but well worth the journey," says Jenny Ekstrom, technology coordinator for PVUSD. "The biggest challenge we faced was that the technology was so new to our industry at the time that no one had experienced it! We basically built the plane as we flew it. It was an incredible learning experience."

**"[TelePresence] is helping us redefine the meaning of rigor, relevance, and relationships in the educational landscape for this new generation of learners."**

**—Dr. Jim Lee, Superintendent, Paradise Valley Unified School District**

PVUSD's new technology is broadcast over a microwave Wireless Wide Area Network (WWAN), and experiences the high-level Cisco quality service through a districtwide telecommunications convergence on Cisco's Voice over Internet Protocol (VoIP) system. The unique broadcast ends up saving the district approximately US\$550,000 annually. Additionally, by leveraging the Cisco infrastructure already in place, connections with other organizations that employ Cisco's infrastructure are made smoothly.

"I frequently get asked why we decided to install Cisco's TelePresence solution," says Billings. "The answer is the simplicity and quality of the integration with our current infrastructure. From the exchange, to the routing, to the VoIP, to the high-definition video, and all points in-between, I am easily able to leverage our prior investments. Essentially, Cisco's stable and intuitive services act as the foundation for PVUSD to launch our own revolutionary concepts."

**Figure 2.** *Intercontinental Cisco TelePresence learning session with Slovakia between four participating Arizona schools.*



Continues Billings, “Our initial goal in deploying TelePresence was to create a remote classroom environment, joining approximately five students at each of three locations into a cost-effective class of 15, where otherwise the class would not be available and/or the teacher re-tasked or terminated. From there, our passion for pushing education to new limits led us to connect to the National LambdaRail (NLR).”

Owned by the U.S. research and education community, NLR is a high-speed, fiber-optic network infrastructure covering 12,000 miles and 21 states across the United States. NLR is the advanced network platform for a wide range of advanced research projects and public-private partnerships. The connection with NLR enables PVUSD to initiate TelePresence sessions with institutions around the world which, in turn, fosters open discussion and growth between PVUSD and the global community.

Cox Business Services, another Cisco partner, provides the district connectivity to NLR, using Arizona State University as a connection point. “To our knowledge, no other K-12 district in the U.S. has joined the NLR and connected with universities and other higher education institutions for joint class delivery,” says Billings. “The power of TelePresence has empowered our district to be a national trendsetter for technology in K-12 education.”

“We want our school communities to connect with the world and the world to us,” says Tom Ohmart, president of the PVUSD school board. “The significant opportunities brought out by this technology allow us to connect with excellence throughout the world. This is a direction we must pursue.”

### **Business Results**

The application of the Cisco TelePresence solution in PVUSD is succeeding in real, discernible ways. For example, as a first course pilot, Calculus III utilized TelePresence to provide instruction to students at multiple schools simultaneously from one highly-qualified teacher.

pvONLINE, the district’s Internet-based educational program, embeds TelePresence to generate a human aspect for online tutoring, conferencing, and evaluation sessions. pvONLINE teacher Kim Stringer says, “It truly feels like I am standing next to my students in a classroom. Not only are they very impressed with the technology, but they are really comfortable learning in that environment. As a teacher, this is the most important aspect to me.”

“Connecting with the best minds and global institutions is in of itself an invaluable asset, but when that communication includes body language, tone, humor, gestures, facial expressions, and more, the communication becomes substantially more vibrant and enriching.”

—Jeff Billings, Director of Information Technology, Paradise Valley Unified School District

**Figure 3.** *pvONLINE teacher's perspective of using the Cisco TelePresence solution*



Jenna, a pvONLINE student says, “TelePresence is great, because I can get to know my online teachers and see what the people behind the computers are like.”

Through Cisco TelePresence technology and the NLR network, PVUSD has connected with institutions such as a sister school in Beijing, China, Duke University, Harvard University, the University of Wisconsin-Whitewater, the Technical University of Košice in Slovakia, Indiana University, Rice University, Georgia Institute of Technology, and SUN YAT-SEN University. These connections are leading to recruitment efforts, guest lectures, joint assessments of student projects, professional development, collaborative team teaching, and more.

“TelePresence provides the means for PVUSD to change the way we communicate, produce, and think,” says Billings. “Connecting with the best minds and global institutions is in of itself an invaluable asset, but when that communication includes body language, tone, humor, gestures, facial expressions and more, the communication becomes substantially more vibrant and enriching.”

Dr. Jim Lee, superintendent for PVUSD, says, “Cisco TelePresence allows our students to communicate, create, and collaborate with some of the best minds and institutions in the world. These applications are consistent with our mission of cultivating world-class thinkers and developing global mindedness in our students. It is helping us redefine the meaning of rigor, relevance, and relationships in the educational landscape for this new generation of learners.”

The district’s internal operations have also improved through the implementation of TelePresence. Cooperation and communication between departments have been streamlined and travel time has been reduced. Classes are being held for teachers to increase certifications and professional development.

Figure 4. *pvONLINE student's perspective of using the Cisco TelePresence solution.*



“Our teachers can better deliver, individualize, and support learning for all students, regardless of physical boundaries,” says Cindy Daly, director of curriculum for PVUSD. “Our professional learning communities are sharing and modeling best practices across the district and across the country. Whether it is teacher/student, student/student, or teacher/teacher interaction, TelePresence is a 21<sup>st</sup> century tool we use to teach 21<sup>st</sup> century skills.”

### PRODUCT LIST

#### Video

- [Cisco TelePresence System 500s \(seven\) and 1300 \(one\)](#)
- [Cisco Unified Videoconferencing 3515 Multi Control Unit \(MCU\)](#)
- [Cisco Unified Communications Manager \(two - CUCM\)](#)

#### Voice and IP Communications

- [Cisco Unified Border Element \(CUBE\)](#)
- [Cisco Unified Communications Manager \(seven - CUCM\)](#)
- [Cisco Emergency Responder \(E911\)](#)
- [Cisco Unity Connections](#)

### Next Steps

“PVUSD is constantly discovering new ways to utilize TelePresence,” says Billings. “It will become further leveraged in the future.” Billings and his team have already begun laying the groundwork for the community to take advantage of the technology. Some of the ideas considered include connecting with members of the U.S. Armed Services deployed overseas, political debates and speeches broadcast to PVUSD high schools and continuing education classes made available to the public.

One proposal that is gaining momentum with district officials is the delivery of the Cisco Networking Academy (CNA) to PVUSD. CNA is a global education program that teaches students how to design, build,

troubleshoot, and secure computer networks for increased access to career and economic opportunities in communities around the world. Taught via TelePresence at various PVUSD campuses, this program is made possible through the unique partnership with the Technical University of Košice in Slovakia and was offered to PVUSD IT staff in September 2010. The results from that first adult-education course generated a technical paper that will be presented by PVUSD at the 2010 ICETA eLearning Conference in Slovakia. The presentation itself is being delivered live through TelePresence, one continent to another.

“Community relations, which were already strong, will only be bolstered as the district’s larger community gets to take advantage of TelePresence and communication increases,” says Billings.

### For More Information

To find out more about the Cisco TelePresence products, go to:

<http://www.cisco.com/en/US/products/ps7060/index.html>



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