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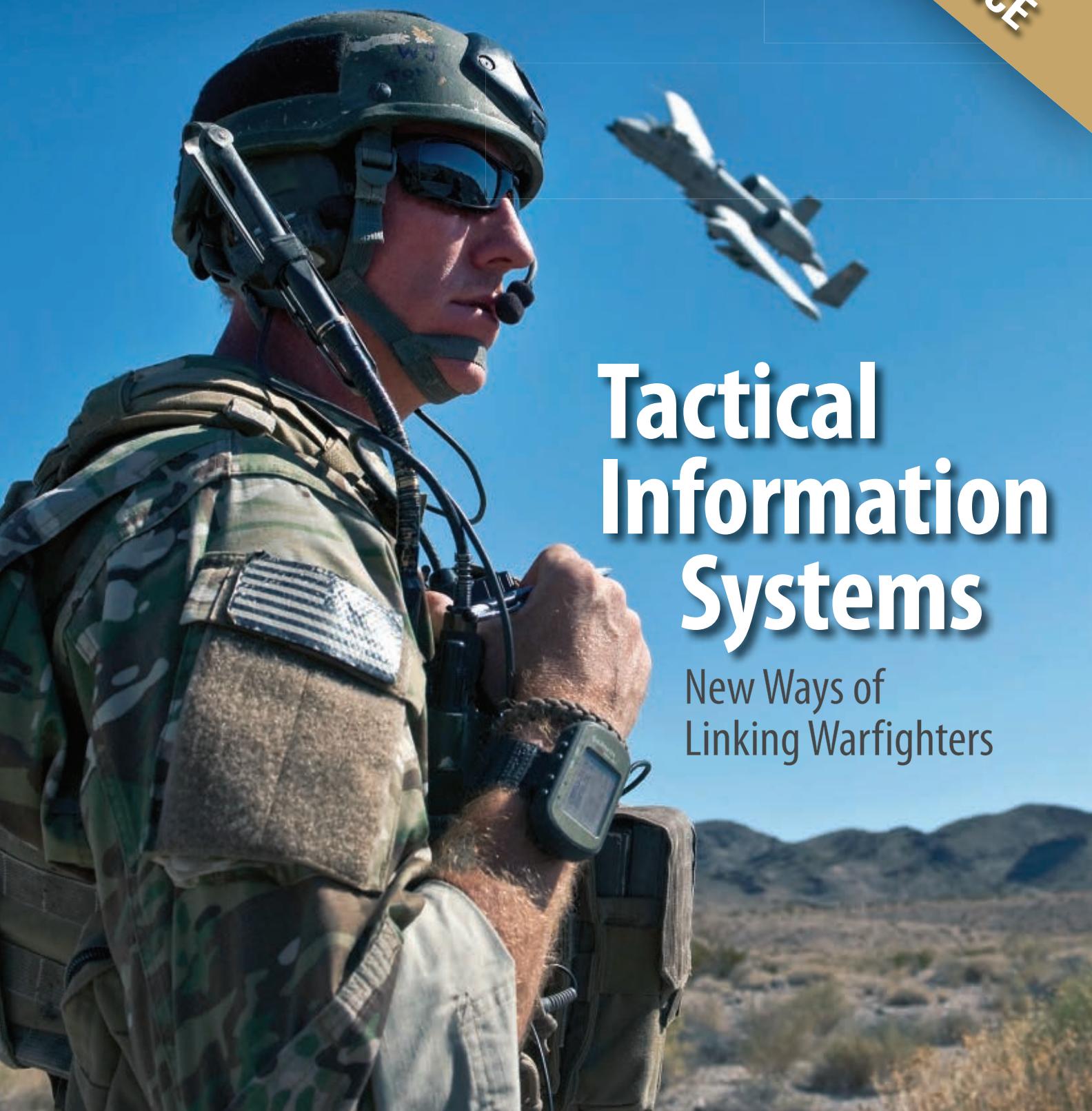
THE NEW APPROACH TO INTELLIGENCE



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Intelligence Data Flies Into the Battlespace

The U.S. Air Force is wrapping its wings around command and control of intelligence, surveillance and reconnaissance information. page 41

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A U.S. Air Force terminal attack controller communicates with A-10 pilots. Greater linkage among warfighters is opening the door to new capabilities for moving information to, and among, individuals in the tactical arena. Cover design by *SIGNAL* Art Director Chris D'Elia based on Defense Department photography by Tech Sgt. Michael R. Holzworth, USAF.

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In this issue

"If we are OK with what we have today, we are going to be irrelevant."

—Maj. Gen. Mark S. Bowman, USA, director of C4, J-6, and CIO, the Joint Staff page 18

"There are a lot of areas where it makes sense for the government to invest in research and development, but tactical communications is not one of them."

—Maj. Gen. Dennis Moran, USA (Ret.), vice president of government business development, Harris Corporation, RF Communications Division page 24

"Cloud requires a very direct approach in that, if you rush into it, you can find yourself in an area of potential failure."

—Dean E. Hall, associate executive assistant director and acting CIO for the FBI page 51

The Medium Is Changing the Message

In a field that long has been rife with change, a revolution is taking place in tactical information systems. The military's adoption of commercial mobile communications technology, such as smartphones and tablets, represents more than just a new way of connecting warfighters and decision makers with the information they need. It also is changing the way that information itself will be defined, processed and distributed.

Both military forces and their civilian counterparts—as well as members of the intelligence community—are embracing the smartphone and tablet technologies that are taking the consumer market by storm. Adopting commercial off-the-shelf information technologies is not new; what *is* new is how these systems are about to transform the battlespace. Instead of being supplemental means of communications, smartphones ultimately may become the primary systems for communications and data exchange. The secure radios that currently define battlespace networking will continue to play an essential role, but they may evolve into specialty devices rather than the default communications links.

So, information available to the warfighter may take new forms. The intelligence community is restructuring its information architecture to have more common elements, which in turn will make it easier for customers to obtain what they need more precisely. Information from different types of intelligence sources may be combined into more versatile products, and these products would be tailored to suit the new mobile media proliferating among users.

For several years, planners have been moving toward the goal of extending the network down to the individual warfighter. Now, that goal is being enabled by consumer technologies that are changing the roles and missions of warfighters. Once again, innovation transforms its product.

Robert K. Ackerman
Senior Director, Publications
Editor in Chief

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Chairman of the Board
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President and Publisher
Kent R. Schneider

Vice President, Publications Associate Publisher
Beverly Mowery Cooper
bcooper@afcea.org

Senior Director, Publications Editor in Chief
Robert K. Ackerman
signalnews@afcea.org

Director, Print Production Managing Editor
Jim Sweeney
jsweeney@afcea.org

Director, Online Production Digital Media Manager
Helen Mosher
hmosher@afcea.org

News Editor
Rita Boland
rboland@afcea.org

Technology Editor
George I. Seffers
gseffers@afcea.org

Defense Editor
Max Cacas
mcacas@afcea.org

Associate Editors
Beverly T. Schaeffer
bschaeffer@afcea.org

Rachel Eisenhower
reisenhower@afcea.org

Publications Assistant
Christina Yanette
cyanette@afcea.org

***SIGNAL* Art Director**
Chris D'Elia
cdelia@afcea.org

Editor at Large
Clarence A. Robinson Jr.

Contributing Editors
Col. Alan D. Campen, USAF (Ret.)
Michael A. Robinson
Paul A. Strassmann

Technical Adviser
Dr. R. Norris Keeler

Senior Director, Advertising
Marsha Carpenter
mcarpenter@afcea.org

Director, E-Newsletters and Directories
Maryann Lawlor
mlawlor@afcea.org

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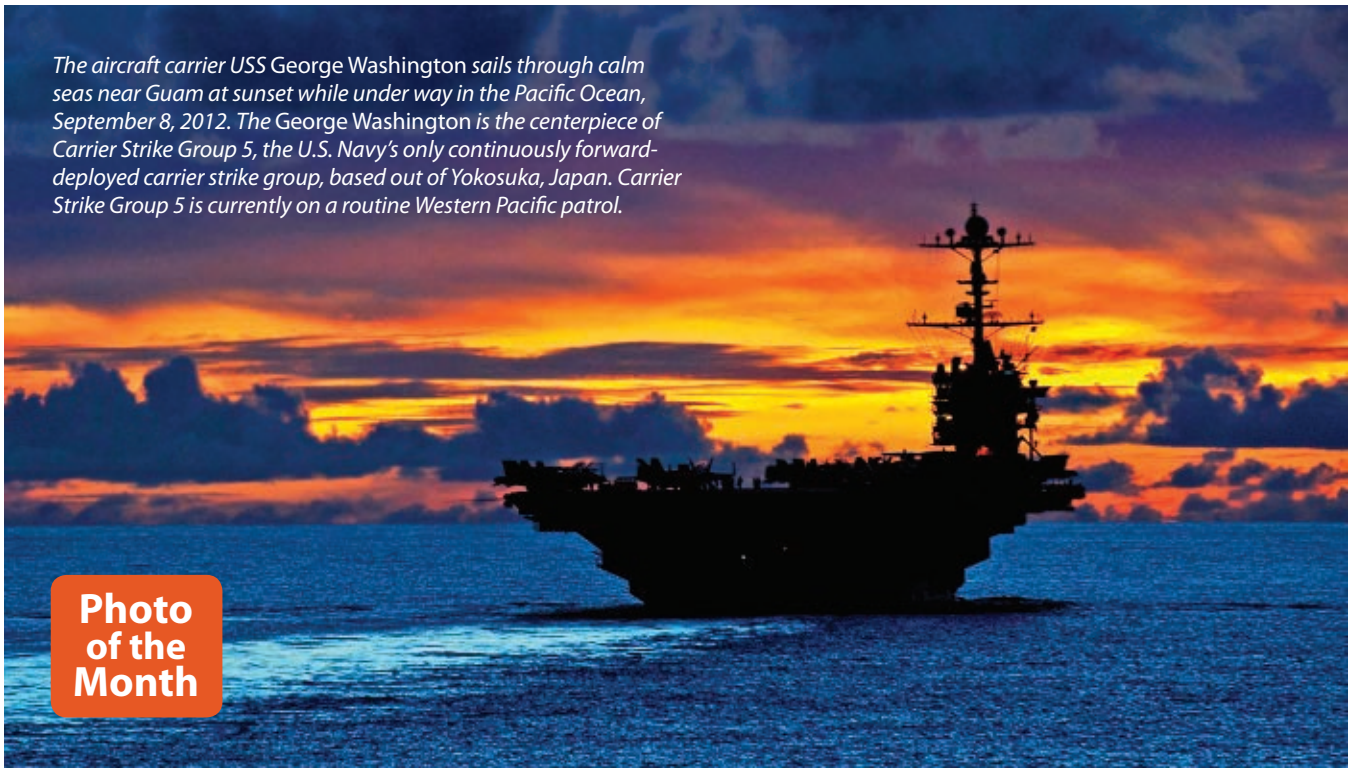
SIGNAL Today



The aircraft carrier USS George Washington *sails through calm seas near Guam at sunset while under way in the Pacific Ocean, September 8, 2012. The* George Washington *is the centerpiece of Carrier Strike Group 5, the U.S. Navy's only continuously forward-deployed carrier strike group, based out of Yokosuka, Japan. Carrier Strike Group 5 is currently on a routine Western Pacific patrol.*

Photo of the Month

SIGNAL Online www.afcea.org/signal

ONLINE EXCLUSIVES

New stories are posted throughout the month. Here are selected recent items from www.afcea.org/signal.

The Outlook for CBRN Defense

The U.S. Defense Department has some hard decisions to make regarding where and how to optimize future research to counter chemical, biological, radiological and nuclear weapons.

DISA Strategic Plan Seeks to Eliminate Ambiguities

The defense information technology realm is exploding with innovation—so much so, the organizations tasked with ensuring effective information systems run the risk of losing control of both the process and its capabilities. The Defense Information Systems Agency has issued a new strategic plan that outlines its approach to ensuring advanced technology implementation without reining in innovation.

These stories and more at http://www.afcea.org/signal/onlineexclusives.asp.

GUEST BLOG

Data Center Consolidation Allows Agencies to Address the Digital Government Strategy

http://www.afcea.org/content/?q=node/10125

HOMEFRONT HELP

Most Thursdays, News Editor Rita Boland highlights programs that offer resources and assistance to the military community ranging from care packages to benefits and everything in between.

http://www.afcea.org/content/?q=taxonomy/term/3

COOL APP-TITUDE

Associate Editor Rachel Eisenhower explores the wide world of mobile and tablet apps, introducing a new featured app every Tuesday. Now includes videos!

http://www.afcea.org/content/?q=taxonomy/term/5375

@SIGNALMAG

What is it about mobile and tablet computing that seems to be rendering laptops and radios obsolete, particularly for the military?

Global Internet access	18%
Portability and multifunctionality	18%
Immediate access to situational awareness	9%
Apps! Apps! Apps!	9%
All of the above	46%

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MILITARY

U.S. Navy Augments Reality

The Office of Naval Research (ONR) is developing a system that allows trainees to view simulated images superimposed over real-world landscapes. The ultimate goal is to provide a one-of-a-kind training experience to better prepare U.S. Navy and Marine forces for the battlefield.

ONR officials describe the system, known as an augmented reality program, as revolutionary, saying it will lower costs and will allow military personnel to tailor their training scenarios no matter where they are, rather than traveling to a specialized simulation facility. The system is similar to technology that allows sports broadcasters to superimpose a first-down line on the televised image of a football field. It uses advanced software algorithms and multiple sensors to determine a trainee's viewpoint while virtual aircraft, targets and munitions effects are inserted into the real-world view through glasses, goggles or a visor.

Officials at the ONR say that Joint Terminal Attack Controller (JTAC) training is one area that could be improved by the system. JTACs work on the ground to manage the attacks of nearby combat aircraft. Currently, live JTAC training is conducted on a limited number of specialized ranges with static targets. It requires aircraft flight hours, range time and live artillery, and it poses some danger.

In December, the ONR will select the most promising head-mounted displays for further development and in 2013, it will conduct two demonstrations in Quantico, Virginia, and Camp Pendleton, California.

Army Maritime Management

The U.S. military's largest land force is fielding a highly mobile and tactically deployable system to manage maritime supply traffic at harbors, shipping channels and beaches. The U.S. Army's Harbormaster Command and Control Center (HCCC) program gives soldier logisticians technologies such as sensors and other mission command tools that enhance situational awareness in hectic shipping environments.

Seven Army units are scheduled to receive the HCCC. At the core of the system is the Rigid Wall Shelter that mounts on up-armored Humvees. The shelter is based on a standard integrated command post system, but it is modified with commercial, military and maritime radios and applications. When combined with the Trailer Mounted Support System-Medium, the shelter allows commanders to see overall common operating pictures.

The HCCC also includes access to the Global Command and Control System and the Battle Command Sustainment Support System, which provides actionable logistics information to commanders in near-real time. Other available technologies include a satellite terminal that provides satellite connectivity to the Army's Warfighter Information Network-Tactical communications network and to commercial providers as well as video cameras to capture day and night images. Main and remote configurations are available to cover multiple mission requirements.

Improved Evader Locator

Personnel trapped behind enemy lines will have new rescue capabilities in the upgraded Combat Survivor Evader Locator (CSEL) radio.

Two capabilities recently added to the Combat Survivor Evader Locator (CSEL) radio are enhancing communications between rescue personnel and isolated individuals, such as downed pilots or soldiers separated from their units. CSEL is a handheld survival radio used with base stations located across the globe. It provides critical search and rescue infrastructure for the joint services and currently delivers over-the-horizon and line-of-sight voice capabilities.

One enhancement, terminal area communications (TAC), provides secure line-of-sight data from a pilot to the person in need of rescue. It enables the pilot flying above to communicate via secure text messaging with the isolated person below. Previously, the only option for direct communications with rescue assets was through voice transmissions. The second enhancement, terminal area guidance (TAG), allows a rescue pilot to ping the radio of an isolated person. From that ping, through onboard distance measuring equipment, the pilot is provided range and bearing to the location of the person to be rescued.

The field upgrade began this summer and will retrofit all U.S. Air Force radios with the TAC and TAG capabilities. In the future, the TAC capability will be integrated into other platforms performing the search and rescue mission, such as the HH-60 helicopter.

RESEARCH AND DEVELOPMENT

A New Type of Robot

The Defense Advanced Research Projects Agency (DARPA) is working on yet another format for a robot that is unlike anything else seen so far. This robot brings a new definition to the concept of flexible and low-cost systems.

The so-called "soft robot" is made of silicone, is able to walk, and can change color to match its surroundings, similar to the way an octopus and other encephalopods do so in the sea. It also is capable of changing its temperature. And, it can do it all for less than $100, which suggests that in the future, such robots could be built in quantity for just several dollars each.

The research is being performed as part of DARPA's Maximum Mobility and Manipulation (M3) program. Scientists at Harvard University's Department of Chemistry and the university's Wyss Institute for Biologically Inspired Engineering are performing the research.

Float Like a Tank

A novel combination of air-filled pontoons, along with a power drive system similar to those used on tanks, has yielded part of a new system designed to help transport freight from ship to shore.

The Defense Advanced Research Projects Agency (DARPA) has tested a one-fifth scale model of the captive air amphibious transporter (CAAT), which the agency says is capable of moving off of a ship, into the water and onto a beach. CAAT is part of the Tactically Expandable Maritime Platform (TEMP), a package of land, sea and air delivery systems designed to facilitate direct support by the military in times of crisis. The platform can be transported in standard shipping containers. In a demonstration, the CAAT also was able to traverse a swamp without sinking.

The Office of Naval Research jointly is funding the CAAT and is considering it as a possible amphibious transport for the U.S. Navy and Marines.

A computer-generated image shows the basic specification of the Royal Navy's Type 26 Global Combat Ship.

BAE Systems/MOD

New Royal Navy Ship

The U.K. Ministry of Defence has released the basic designs for the Royal Navy's Type 26 Global Combat Ship (T26 GCS), its next generation of warships. Scheduled to first operate the ships after 2020, U.K. sailors will use the vessels in combat and counterpiracy operations as well as to support humanitarian work worldwide.

The T26 GCS will be one of the most advanced platforms in the Royal Navy, expected to feature capabilities such as vertical missile silos that can accommodate various weapons; a hangar to house a Merlin or Wildcat helicopter; a flexible mission space for unmanned air, surface and underwater vehicles as well as additional boats; and the most advanced sensors in the fleet.

The Defence Ministry has worked with contractor BAE Systems for approximately two years to determine the ships' basic capabilities and baseline design. With this first release complete, program officials now will turn their attention to more detailed specifications.

AEROSPACE

NASA Seeks Lunar Mining Solutions

With a return to the moon in mind, NASA now is accepting submissions for its fourth annual Lunabotics Mining Competition. This effort challenges university students to develop innovative lunar excavation concepts. In addition to engaging students in science, technology, engineering and mathematics, NASA hopes the solutions could apply to actual devices or payloads.

The competition asks students to design or build an excavator, called a Lunabot, that can mine and deposit a minimum of 10 kilograms of simulated lunar dirt within 10 minutes. Additional challenge factors include weight and size limitations and the ability to operate the system from a remote mission control center. In addition to meeting the material excavation requirements, scoring factors include design and operation, dust tolerance and projection, communications, energy/power requirements and autonomy.

Registration is open now and is limited to 50 teams. The evaluation event will be held at NASA's Kennedy Space Center in Florida from May 20-24, 2013.

Career Progressions

Government

Bonnie Apodaca has been named vice president of Business Operations and chief financial officer at Sandia National Laboratories, Albuquerque, New Mexico.

The FBI, Washington, D.C., has named **Richard McFeely** (l) executive assistant director of the criminal, cyber and response services branch; and **Ronald Hosko** assistant director of the criminal investigative division.

Military

Vice Adm. John M. Richardson, USN, has been nominated for appointment to the rank of admiral and assignment as director, Naval Nuclear Propulsion Program, Department of the Navy/Department of Energy, Washington, D.C.

Capt. John P. Neagley, USN, has been selected for the rank of rear admiral and assigned deputy commander, Space and Naval Warfare Systems Command, San Diego.

Maj. Gen. Christopher C. Bogdan, USAF, has been nominated for appointment to the rank of lieutenant general and assignment as director, Joint Strike Fighter Program, Office of the Secretary of Defense, Arlington, Virginia.

Rear Adm. David A. Dunaway, USN, has been nominated for appointment to the rank of vice admiral and assignment as commander, Naval Air Systems Command, Patuxent River, Maryland.

Maj. Gen. David R. Hogg, USA, has been nominated for appointment to the rank of lieutenant general and assignment as U.S. military representative to the NATO Military Committee, Belgium.

Rear Adm. Jeffery R. Penfield, USN, has been nominated for assignment as commander, Operational Test and Evaluation Force, Norfolk, Virginia.

Rear Adm. James D. Syring, USN, has been nominated for appointment to the rank of vice admiral and assignment as director, Missile Defense Agency, Fort Belvoir, Virginia.

Col. Paul J. Laughlin, USA, has been assigned chief of Armor, and **Col. David B. Haight, USA**, has been assigned chief of Infantry, Maneuver Center of Excellence, Fort Benning, Georgia.

Capt. Bruce H. Lindsey, USN, has been selected for the rank of rear admiral and assigned deputy director for operations, J-3, Joint Staff, Washington, D.C.

Capt. Lawrence E. Creevy, USN, has been selected for the rank of rear admiral and assigned commander, Naval Surface Warfare Center, Washington Navy Yard, Washington, D.C.

Industry

Engineering Services Network Incorporated, Arlington, Virginia, has named **Kathleen Casey** executive director of Veterans Affairs.

Lockheed Martin, Bethesda, Maryland, has appointed **Rick Ambrose** vice president and deputy, Space Systems Company, and **Tim Reardon** has been named head of the company's Information Systems and Global Solutions–National.

ManTech International Corporation, Fairfax, Virginia, has named **H. Christopher Goodrich** senior vice president of its SIGINT Solutions and Cyber Operations Business Unit, Hanover, Maryland.

MBDA Deutschland GmbH, Schrobenhausen, Germany, has named **Thomas Homberg** managing director and executive group director, Improvement.

STG Incorporated, Reston, Virginia, has hired **Steven Bouchard** as vice president, Integrated Capture Management Services.

Scott Heefner has been named vice president of the Financial and Business Analytics Group, TASC Incorporated, Chantilly, Virginia.

Michael J. Millward has joined TWD and Associates Incorporated, Arlington, Virginia, as director, Special Projects Business Sector.

Dustin Kramer has been appointed president of Eurotech subsidiary Parvus Corporation, Salt Lake City.

Deven Kalra has joined AtHoc Incorporated, San Mateo, California, as vice president of Engineering.

Thomas Hobika has joined EarthLink Incorporated, Rochester, New York, as vice president of the company's IT Solution Consultants organization.

Frank Wilson has joined iRobot Corporation, Bedford, Massachusetts, as senior vice president and general manager of its Defense and Security business unit.

Cornelius L. Grady has joined NetSecurity Corporation, Dulles, Virginia, as director of Business Development.

Skyera Incorporated, San Jose, California, has named **Frankie Roohparvar** chief operating officer.

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While military organizations in the United States and Europe brace for reductions in their budgets, India plans to increase its defense spending. With leaders such as U.S. Defense Secretary Leon Panetta calling for expanded cooperation with the peninsular nation, and various groups hoping to sell more products to its burgeoning military, now is a good time to brush up on knowledge about the country. Indian government officials have invested in numerous Web pages to offer insight into their work.

Science and Technology

http://india.gov.in/sectors/science/index.php

Visitors here can learn more about national- and state-level science and technology efforts underway in India. The site serves much as a portal to more detailed Web pages, with links to various government or independent groups. Reports and guidelines also can be accessed. Information about research in atomic energy and space is available through drop-down lists on the main page.

Defence

http://india.gov.in/sectors/wdefence/index.php

This site is a good starting point for anyone looking to learn more about India's defense and internal security organizations. Expand the drop-down menus to access overviews on various military and security groups. The Ministry of Defence link transfers users to a page breaking down subordinate and related units into categories, providing links to each one.

Defence Research and Development Organisation

www.drdo.org

Companies that want to do business with the Defence Research and Development Organisation can access the offerings here to learn more about major projects and procurements. Under the latter section, site visitors can obtain contact information for the correct officials in different offices of the organization. Videos offer an overview of various vehicle launches. At the bottom of any of the site's pages is a link to the Defence Science Forum, created to improve defense forces through expanded interaction among scientists working in diverse subject areas.

Business

http://business.gov.in

As a service of the government of India, this site focuses largely on providing information to Indian citizens about business in their home nation. But the array of resources makes it a solid starting point for anyone looking to sell or buy within the country. Taxation and infrastructure are addressed along with an overview of trade and reasons to invest in businesses there. The section dedicated to exporters and importers includes information about how to start moving goods into India as well as links to necessary forms.

Communication and Information Technology

http://india.gov.in/sectors/communication/index.php

Another of the India.gov sites, this one focuses on communications and information technology. As with the defense and the science and technology areas, the main page features links to a variety of resources. Learn about some of the major initiatives underway in the sector or become familiar with telecommunications in India. Visitors can connect with other national and state organizations as well.

Overseas

http://india.gov.in/overseas.php

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Mission-Focused and Effective Conferences Always Will Be in Demand

BY KENT R. SCHNEIDER

Since the U.S. General Services Administration scandal over a training conference in Las Vegas, reinforced by concerns over two expensive Department of Veterans Affairs conferences, fear has spread across government and industry that government-related conferences are now a thing of the past. This is just not the case—nor should it be.

If government leaders make bad decisions with respect to conferences—or other areas within their job scope—they should be held accountable. Controls should be in place to minimize future abuses. Organizations that support government in conferences that recommend or support such abuses similarly should be penalized.

The May 11, 2012, memo from the Office of Management and Budget applying controls to travel and conferences clearly had two objectives. The first was to direct a management approval process for all federal agencies to ensure consistent review of proposed travel and conferences, along with adherence to policies. The second was to achieve spending reductions of 30 percent in travel and conference costs from fiscal year 2010 levels. Implementing guidance from federal agencies has reinforced these objectives, directing the leadership at every level to focus conferences on mission needs and to ensure government requirements are met at these conferences in a cost-effective way.

The AFCEA leadership has met with a number of senior government leaders to clarify the emerging policies and to understand how the association can help the government manage the process. The message has been clear and consistent: Government personnel need to conduct or attend conferences to communicate effectively among each other and with industry and academia. The requirement for effective communications is perhaps greater than ever, in this period of constrained budgets, to support effective development, acquisition and investment. Conferences must be focused in mission-critical areas and must support needed training and education.

To help with budget reduction, conferences should be planned in locations that will minimize travel requirements. Planning conferences near concentrations of government participants will benefit organizations. Holding conferences regionally or locally when possible will reduce long-distance travel and per diem costs. Because planners do not know whom the government will want to send to conferences, early coordination with the target agencies or commands will help in scheduling conferences in appropriate venues before contracts are signed.

Registration costs for government participants should be kept to a minimum. Government ethics regulations allow lower costs for government personnel, down to zero if appropriate. If no government registration is charged, attention must be given to the gift regulations for government to ensure that costs for food and other items provided to government attendees are recovered. Charging individually for meals is one way to cover such costs.

Maximizing the training and training credits provided at conferences is important. This is one area where advanced work with the government to define needs is crucial. Conferences are excellent venues in which to provide consistent training across government organizations. But training must be focused in mission-essential areas, and certifications or continuing education units need to be provided to document the training. AFCEA is particularly effective in conducting such training and providing needed credit. Any conference planner at the regional or chapter level who needs assistance with this effort should contact the AFCEA International staff, who can help with set-up or provide training support.

Networking opportunities at conferences are important because they provide the means for dialogue among government, industry and academia. It is important in planning to provide such opportunities, but it should not be excessive. Such networking events should be simple and cost-effective. In most cases, one or two such events during a conference are sufficient.

As many who have been involved with conferences know by now, the government approval process escalates based on total anticipated government cost. The three thresholds are below $100,000, $100,000 to $500,000, and above $500,000. For the Defense Department, anything above $500,000 must be approved by the deputy secretary of defense. The time required for approval will depend on the level of approval and the completeness of the approval package. The approval package must be submitted by the government lead for the conference or by someone determined to be the executive agent if it involves a joint government audience. If all the criteria are described fully in the approval package and seem reasonable to the approval authority, the process will move more quickly. Early coordination with the government and early submission of the approval package will help ensure that the approval comes in time.

Travel restrictions, educational requirements and dollar thresholds aside—the bottom line is that government personnel need to conduct or attend conferences that support mission requirements. We in AFCEA need to help them be compliant with the emerging policies so they can obtain maximum value from the conferences they attend.

Not Your Father's J-6

The newly reconstituted Joint Staff office is not just picking up where the previous version left off.

By Robert K. Ackerman

After a two-year organizational hiatus, the Joint Staff J-6 billet is back with a new focus on interoperability and enterprisewide networking capabilities. These new authorities come as the military seeks to exploit commercial mobile communications technologies to an increasing degree with results that could change the nature of defense networking as well as its procurement.

All of the issues that have defined defense information technology utilization—interoperability, security, rapid technology insertion—are part of the thrusts being launched by the new J-6. Even the very nature of requirements may change as industry adopts the new approaches being endorsed by the Joint Staff's new information office.

"This is not the same J-6 that existed before," declares Maj. Gen. Mark S. Bowman, USA, director of command, control, communications and computers (C^4), J-6, and chief information officer (CIO), the Joint Staff. "It is very different."

Foremost among the differences is that the new J-6 now is also the Joint Staff CIO, which brings new responsibilities along with an inward focus. This focus is appropriate, the general states, explaining, "We ought to be able to execute what we think ought to be executed elsewhere." This allows the new J-6 office to take innovations and new directions that it has adopted and push them throughout the military.

The new J-6 also has the C^4 interoperability responsibilities that came from the disestablished Joint Forces Command (*SIGNAL* Magazine, July, page 59). Elements of that command's J-8 were transferred to the Deputy Director for C^4 (DDC4) office, which was responsible for C^4 integration and assessments. The DDC4 office has been incorporated into the new J-6. Gen. Bowman notes that 70 people from the 170 in the former J-6 were assigned to the DDC4. Those and the people from the other absorbed organizations totaled 1,100 people in the new J-6. Reductions have brought that number down to a little more 800. When the original J-6 was eliminated, its missions were parsed to other organizations. Those missions have been reclaimed, Gen. Bowman says, but the personnel slots were not added to the new J-6. The J-6 has met its responsibilities by tapping its existing human resources.

The J-6 established a new directorate—Information Technology Transformation, or ITT. This directorate focuses on the way ahead, Gen. Bowman says. "They are looking at what we are doing with the portal, and when we are going to have thin client across the Joint Staff," he says as examples. Gen. Bowman relates that the Defense Department CIO establishes policy; the Joint Staff J-6/CIO generates requirements and engages in facilitation; and the services execute. "If we stay in those lanes—and mutually assist each other with those lanes—we can get to where we need to go," he warrants. "We have had no problem staying in those lanes."

Interoperability is the general's top priority, both across the services and among coalition partners. At the heart of this effort is the Joint Information Enterprise (JIE) program, which the general offers is making significant strides. "It's not something that's nice to have; it's something we must have," he

A U.S. Air Force airman adjusts the frequency of the Roll-On Beyond Line of Sight Enhancement (ROBE) datalink system in Kyrgyzstan. ROBE connects manpower assets on the ground, which may not have effective line-of-sight communications capabilities, to other ground or airborne units. The new Joint Staff J-6 is pushing for enterprise efforts to ensure service and coalition interoperability.

declares. "We have to have interoperability baked in from the beginning in what we do."

The general continues that one perfect example of an enterprise solution is enterprise email. Not all users need to run their own email systems, he says. The Joint Staff switched to enterprise email for nonsecure Internet protocol router network (NIPRNET) operations a few months ago by beginning with a pilot effort in the J-6 and then spreading it across the entire Joint Staff. The Defense Information Systems Agency (DISA) provided this service. By the end of this year, the J-6 will have secret Internet protocol router network (SIPRNET) enterprise email.

This activity was enabled in conjunction with thin client, and the Joint Staff wants to push thin client "in a big way," the general offers. The primary reason for that emphasis is security. The thin-client approach in an enterprise environment allows rapid application of patches—in minutes or even seconds—or changing of operating systems over only a weekend. The J-6 has several ongoing thin-client activities underway, and about 2,000 accounts will be using it by the end of the year. "My goal is to be completely moved over to thin client on SIPRNET and NIPRNET before I leave the Joint Staff," Gen. Bowman declares.

This enterprise effort will see an increased emphasis on commercial off-the-shelf (COTS) equipment "that is interoperable from the get-go," Gen. Bowman declares. "We have to be willing to accept 80 percent solutions today, implement them today, and then gradually evolve them over time—and we will end up with capabilities that we never dreamed of in the past."

The general analogizes this effort to the technological march that has taken place in recent years. Five years ago, no one would have guessed how smartphones would be used today—"not even Steve Jobs," he points out. "He wouldn't have predicted that we'd use an iPhone to check in at the airport; as a GPS [Global Positioning

System] in our cars; or for so many other things, when he unveiled it over five years ago."

Another key thrust for the J-6 is to enable Joint Force 2020. Gen. Bowman notes that what the J-6 can influence in the program objective memorandum carries out to 2020. "Much of what we will have for capabilities in 2020 already is decided. Some people have estimated that we already have 80 percent of the capabilities that we will have in 2020. IT [information technology] lies in that other 20 percent. There is huge room for change in IT between now and 2020. Huge advantages will be made between now and 2020," he states.

The J-6 has other enterprise projects in the works. Among these is data center consolidation, which the general describes as a huge effort. He says the Marine Corps data center is likely to stay, but other data centers are being considered for consolidation to reduce the number of facilities in use. Moving to the cloud is another key activity, and it is spurring other potential changes. "My view is that, anything that is a public-facing Web page, we ought to seriously look at putting in a commercial environment," the general offers. "We're looking at the right way to do that and the right stuff to put in there." He adds that his office will continue to meet with industry to explore these types of opportunities.

Maj. Gen. Mark S. Bowman, USA, is the director of command, control, communications and computers (C⁴), J-6, and chief information officer (CIO), the Joint Staff.

Gen. Bowman emphasizes that the military's end-state architecture is everything over IP (EoIP). "If people say that we can't put everything over IP, then OK—make it almost everything over IP. It's the wave of the future, and we need to embrace that—not fight it, embrace it."

Achieving necessary interoperability will entail building on past successes, the general maintains. For coalition interoperability, the Future Mission Network is evolving from the Afghan Mission Network, and the J-6 is striving to establish a set of tactics, techniques and procedures (TTPs) that could be used by coalition partners.

The goal is a network that would be able to operate from the onset of deployment, whether disaster relief or combat operation.

Yet issues remain. One is encryption; and the general offers that different degrees of encryption may provide the best security for the fully interoperable coalition network. Significant moves have opened the door to establishing network security where not everything is given Type 1 encryption. For example, the general offers, commercial encryption may be good enough for perishable data. "If I get a call for fire or a troops-in-contact report, why would commercial encryption not be good enough there?" he asks. "It's all perishable data. If the bad guy is able to decrypt it in two weeks and figure out what the request was, that mission is long over [by then]. Whereas, the true benefit of commercial encryption is that we can give a radio to one of our coalition partners going out on a mission ... and we can coordinate intelligence as we go through an operation with a coalition partner. If we receive intelligence that changes the situation on a battlefield, we can get that information to partners so that they can change the way they are going to approach their particular mission."

Because the United States spends more on defense than other nations, it tends to set standards for military information technology systems. That standard-setting must be done carefully, the general warns. "If we decide a standard, and coalition partners procure equipment [accordingly] to be interoperable—and then we decide to change the standard tomorrow—that causes us not to be interoperable and [a partner country] to have to play catch-up with a much smaller budget and a much longer reaction time," he allows.

Gen. Bowman offers that service interoperability is not a prerequisite for coalition interoperability. "I think they can come simultaneously," he says. "Much of what we do IT-wise today is commercial off-the-shelf related. With the proper set of TTPs and agreed-upon way ahead by services, we can get to interoperability simultaneously. We really don't have a choice."

The general explains that the military does not have the luxury of proceeding service-by-service in a buildup to coalition interoperability. "We need set architectures out there; and when people build to those architectures, their wares get included. If they don't meet those architectures, their wares do not get included. And, we're being driven to those architectures today by commercial off-the-shelf equipment," he states. "If we try to develop our own equipment in big programs of record, it takes time. Others are able to develop those things, and there are game-changing devices out there today that we ought to be looking at hard and adapting."

Two Air Force cyber transport technicians hook cables in to the new Air Force Network (AFNet) router at Eielson Air Force Base, Alaska. The AFNet system recently came online at Eielson and has enhanced cyber capabilities by providing network oversight to all Air Force installations.

The general notes that senior commanders across the services face challenges of establishing operational priorities for using valuable bandwidth. These types of trade-offs will continue as commanders on the ground weigh priorities for communications and bandwidth, especially as changes continue to define the network.

Gen. Bowman allows that he works closely with his equivalents in the individual services. "I spend more time with the service -6s than I do with the combatant command -6s," he states. That may change in the future. The bulk of the J-6's recent effort has involved the JIE and CIO matters, and Gen. Bowman offers that he has not spent enough time with the combatant command -6s as he believes he should have. While they do share information, he wants to build a closer relationship with them than he has today.

Technology and culture are at the heart of the J-6's efforts to implement long-term changes on the force. Part of the cultural challenge is the belief that the U.S. military conducts information technology implementation better than anyone else. Yet, the validity of that statement hamstrings efforts to improve. Gen. Bowman notes that many new technologies available today—such as "one box, one wire"—could save billions of dollars if they were adopted. The Defense Department does not have any exact figures for the amount it spends on information technology across the board, because different vehicles and organizations are used for its acquisition. Again, moving to an enterprise environment can help the department understand how much it spends on information technology as well as gain control of the acquisition process, particularly with regard to interoperability and priorities. "It ought to be vendor-agnostic and focused totally on the requirements and the architecture," he says of information technology acquisition.

Letting go of control may be necessary to win many of the cultural battles,

A U.S. Navy information systems technician troubleshoots network equipment onboard the USS Carl Vinson. *Future U.S. military platforms may be designed with space designated for communications equipment, which would be incorporated after the platform rolls off the assembly line.*

the general continues. For example, instead of focusing on running information technology, organizations should focus on their core competencies and let others provide information technology as a service. Even as DISA provides the J-6 its email, the J-6 runs the help desk. Gen. Bowman states that his organization does not need to run its own help desk, and instead it should move that help desk to another organization accustomed to operating a help desk to provide a net savings for the department. Others can follow suit.

Mobile technologies currently are the hot items for military information technology. Gen. Bowman states that the force needs mobile devices that are secure enough for operation. Ongoing pilot programs with iPads, iPhones, Droids and other tablets are part of the move toward a more mobile environment. Common Access Card (CAC) enabling is a requirement, he stresses. "We're going to use the hard token for security reasons as opposed to user identification and password," he warrants. "We are going to line ourselves up by what needs to be done to achieve the appropriate level of security, and we're not going to waver from that.

"We will take the appropriate level of risk, but we need to truly understand what we're getting—and there will be some requirements that we're not going to back off of," he continues. "When we say an 80 percent solution, in that 80 percent will be the requirements we will not back off of." Interoperability and nonproprietary solutions—open systems built to standard—are two other 80 percent requirements, he adds.

"There has never been a greater dependence on the network than there is today; there has never been a more significant cyberthreat than there is today; and it will only get worse in the future—and, we're faced with fiscal realities where we're going to have smaller budgets in the future," Gen. Bowman points out. "We're going to get driven to interoperability, and we're going to get driven to enterprise solutions."

Great changes are coming by the end of this decade, the general predicts. He points out that by 2020, digital natives will be in leadership positions in the U.S. military. Their understanding of digital systems and capabilities will be proactive rather than reactive. The tactical operations center (TOC) of the future will be very different from today's version. Wireless connectivity will define the TOC, as warfighters will be able to pull down information into a handheld device. Handheld capabilities will increase in number and grow in sophistication, all amid greater interoperability.

The evolution that will define future military information technology also will change the very definition of requirements. Gen. Bowman believes that, when a service buys a platform, it should dedicate a certain amount of space in that platform for communications equipment. That space would include internal duct work for cabling, sufficient power and adequate cooling. Then, the platform would be ready for its communications when it rolls off the assembly line—which is the time when the communications should be purchased, not before.

"Honesty and openness" are the two most important elements that Gen. Bowman says he needs from industry. "When they say they have a product that meets certain standards, it needs to meet it. [It should not be] a black box with some knobs on the outside and no guts on the inside—a concept they are looking for us to embrace and then pay for the R&D [research and development] on. They are making enough money so that their R&D dollars ought to be focused on what they think they need to build to meet the needs of the customer," he declares. "And, the customer isn't only the Defense Department—it's the world.

"We saw what happened over the past five and a half years," the general says. "I cannot predict [what will happen in] 2020. But I know we will have to get there incrementally, or we are going to be irrelevant.

"Our adversaries are using COTS technology," he continues. "We need to stay ahead of them and use COTS technology and understand it and understand its limitations—and we need to make sure we're lockstep with the Cyber Command and NSA [National Security Agency] as well."

The biggest enemy the military faces with effective information technology use is delay, Gen. Bowman declares. "If we do nothing, that's the worst thing that could happen," he warrants. "If we are OK with what we have today, we are going to be irrelevant."

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TACTICAL COMMUNICATIONS TECHNOLOGY REACHES INFLECTION POINT

Military radio experts reveal emerging trends in acquisition and technology.

BY GEORGE I. SEFFERS

The current combat communications marketplace is undergoing major transformations, including budget restrictions, greater demands for data at the tactical edge and the emergence of smartphone technologies on the battlefield. Under such dynamic conditions, military forces may need to abandon the program of record acquisition model to provide the most state-of-the-art systems to the warfighters as rapidly and inexpensively as possible, some experts say.

The tactical communications market is at an "inflection point" for several reasons, says Maj. Gen. Dennis Moran, USA (Ret.), who is vice president of government business development for the RF Communications Division at Harris Corporation, Melbourne, Florida. "Technology in the radio area, the mobile area, is changing rapidly. You have a demand for wideband services down to the tactical edge, and you have the downward pressure on the budget," he explains. "When you put all that together, the department has to invest in a much more cost-effective way to take advantage of the technology. There's an opportunity here for the Department of Defense to take a totally different direction."

Gen. Moran says he sees the military already moving away from the program of record model because it no longer is feasible for this technology. Innovation and change are occurring in this industry beyond the reach of such programs. "The days of the program of record have got to be gone. Everybody is seeing that this program of record model is not working. The Marine Corps has abandoned it. The Navy has abandoned it. The Air Force has abandoned it," the general points out.

The Joint Tactical Radio System (JTRS) is the U.S. Defense Department's primary remaining tactical communications program of record model. JTRS was conceived in the mid-1990s and has been restructured and delayed to the point that some warfighters have begun fielding alternatives, including the Harris AN/PRC-117G, which could be an even bigger seller if the military forsakes the program of record acquisition model. Brig. Gen. Kevin J. Nally, USMC, the Marine Corps director of command, control, communications and computers and the chief information officer, has described the Harris radio as a "game-changer" in Afghanistan *(SIGNAL* Magazine, March, page 18).

The JTRS program office announced in August that the AN/PRC-154 Rifleman Radio has received its security certification from the National Security Agency and is preparing to move into full-rate production. Gen. Moran recommends continuing with the limited-rate initial production of JTRS radios, which would allow the system to gain more exposure with the warfighters, and then enabling industry to offer alternatives as the system goes into full-

rate production. He credits several Harris competitors with developing innovative solutions and suggests the Defense Department should place JTRS alternatives in a "store" or "catalogue," allowing warfighters to pick and choose whichever solutions best suit their needs. "This is not a new acquisition model. This is something they've already done with handhelds," Gen. Moran states.

One advantage of the changing dynamic is that companies are investing their own "nickels" in research and development, virtually eliminating the need for the government to do so, Gen. Moran contends. "There are a lot of areas where it makes sense for the government to invest in research and development, but tactical communications is not one of them," he says.

Gen. Moran expresses optimism that the U.S. Army and the Defense Department will adjust the acquisition model to take better advantage of industry innovations. He cites the Army's Network Integration Evaluation process as a positive development. Other experts, however, seem less hopeful about the department's ability to adapt to changing conditions. "We have a tendency to fight the previous war. The war they are fighting now is with laptop computers, and if you look at all of the policies that are coming out for mobile devices, they're putting the exact same restrictions on mobile devices that you would put on a laptop," says Pat DeShazo, who heads the Combat and Command Air Force Space

Private first class Taylor Cardinale, USA, from 1st Platoon, Charlie Company, 2nd Battalion, 503rd Infantry Regiment, 173rd Airborne Brigade Combat Team, calls in grid coordinates over a tactical satellite radio in the Kunar province of Afghanistan. Industry experts see a merger of intelligence, surveillance and reconnaissance functions and tactical command and control as greater amounts of data are pushed to the tactical edge.

Security department at the MITRE Corporation, McLean, Virginia.

Research by DeShazo and his colleague, Bob McKee, technical integrator in MITRE's Army Programs Directorate, led to the development of the Wearable One-Way Transfer (WOWT) device, which is designed to be worn by squad or platoon leaders who often use unclassified radio networks. It allows them to pass situational awareness data up the chain to classified networks. MITRE also has formed a Government Mobile Applications Group, an open community of representatives from the government, military, academia and industry that is designed to explore the use of smartphone technology in the military and government. The group's objective, McKee says, is to find ways to "protect soldiers, protect data and protect the network." A MITRE spokesperson points out that DeShazo and McKee voiced their own opinions and not the organization's views.

The warfighters' demand for information at the tactical edge is one of the major trends mentioned by a variety of experts, and according to some, it is leading to a merger of intelligence, surveillance and reconnaissance (ISR) and tactical command and control (C^2) functions. In the past, recounts Denis Couillard, director of products innovation with Ultra Electronics, Montreal, ISR information would be gathered, stored, analyzed and disseminated by higher headquarters down to the tactical C^2 warfighters. "Right now, there is a convergence of command and control into what some people call actionable intelligence," Couillard observes. "At the battle edge, people don't want to wait for all of this stuff to find its way to a database. The guys who do tactical command and control, when they want to assess a situation, want this enhanced situational awareness immediately."

That need drives a demand for smartphone technologies, Couillard asserts, predicting that, especially in the United States, smartphones ultimately will replace radios. "All of these multi-hundred-million-dollar programs are being torpedoed by the smartphone. The general trend in the United States is that these smartphones will replace the legacy radio platforms," Couillard says. To meet customer demand, Ultra Electronics has integrated different technology families into a product known as UltraMove. The system delivers Internet protocol services, including voice, data and video in a portable transit case, providing connectivity at the outskirts of military networks. The system provides 400 megabits of shared aggregate bandwidth to simultaneously support multiple users and applications. It also provides Wi-Fi, WiMAX and high-capacity, line-of-sight, wireless point-to-point radio.

U.S. Air Force combat controllers set up communications to contact the special tactics operation center while conducting a drop zone survey in Port-au-Prince, Haiti, during Operation Unified Response. Industry experts credit special operations forces for being on the forefront of rapidly fielding cutting-edge tactical communications technology.

Gen. Moran predicts a future—maybe seven years from now—where warfighters will use one device, possibly a tablet, with integrated radio, smartphone and sensor technologies. "I think where we're moving is to a device, a software-defined device, that incorporates the radio frequency portion and the user interface, and you want that to be a multipurpose device. Because of the cellphone technology and because the power of the processor has so much more capability, you have the ability for a system to be not only a communications device, but also a sensor," Gen. Moran states. Integrated sensors could detect transmissions from friendly and enemy forces, providing greater situational awareness. Harris has been working with special forces to determine the best solution for alerting a soldier to enemy transmissions in the area, Gen. Moran reveals. "What they really, really need is high-definition video down to that special operator level," he adds. Harris offers the RF-3590 tablet, which provides secure access to full-motion ISR video, situational awareness displays and tactical databases at the lower echelons. It also allows real-time sharing of information across the battlespace.

Meanwhile, officials with the Thales Group, Neuilly-sur-Seine, France, say their customers are looking for solutions in three primary areas: more services inside the radio, increased data rates and greater networking capabilities. Thales offers an array of systems to meet the need, including the PR4G/F@stnet Geomux waveform. Geomux provides simultaneous voice, data and transverse blue force tracking, which allows a soldier to talk and send files and messages within his unit and to know the positions of other vehicles regardless of unit. Thales officials say one F@stnet radio replaces three traditional systems.

Couillard points out another advantage to providing smartphone technologies on the battlefield. "Since you can store videos and music on a smartphone, soldiers tend to take care of them," he says.

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WEB RESOURCES

Joint Tactical Radio System:
http://jpeojtrs.mil/Pages/Welcome.aspx

Network Integration Evaluation:
www.bctmod.army.mil/nie_focus/index.html

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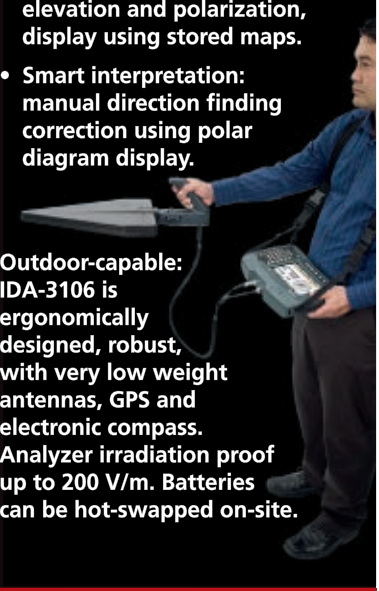

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Better Visibility Across the Battlefield

A key release for blue force tracker brings new benefits to two theaters.

BY RITA BOLAND

The U.S. Army's system for enabling shared situational awareness to track friends or foes at the lowest tactical levels is undergoing multiple capabilities upgrades intended to increase the value of the technology. Advances include the ability to handle more data traffic, as well as better encryption, more timely reporting of position and improved navigation.

These software enhancements for the Force XXI Battle Command Brigade-and-Below/Blue Force Tracking (FBCB2/BFT) are dubbed the Joint Capabilities Release (JCR). The software uses the BFT 2 network, a new satellite

A soldier from the 2nd Brigade Combat Team, 1st Armored Division, uses the new version of the U.S. Army's friendly force tracker and messaging software, known as Force XXI Battle Command Brigade and Below/Blue Force Tracking Joint Capabilities Release (JCR), inside his vehicle. The combat team assesses technologies during the Army's Network Integration Evaluations. The JCR has been deployed to Korea and Afghanistan.

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infrastructure that can handle significantly more data than the first version of the tracking system, according to Jeff Forgach, chief, readiness management, Joint Battle Command–Platform (JBC-P), under the U.S. Army's Program Executive Office Command, Control and Communications–Tactical (PEO C3T). The end state of the JCR enhancement to the FBCB2/BFT is the JBC-P.

The FBCB2/BFT provides integrated, on-the-move battle command information from brigade to platform, as well as across platforms with a brigade task force and other joint forces. According to the program executive office, the JBC-P is the next generation of the system, providing joint-centric on-the-move digital command and control and situational awareness to tactical combat, combat support and combat service support leaders and warfighters.

With the JCR, soldiers can transmit more frequent and larger message traffic. In many cases, the technology also will cut the system's refresh rate from minutes to seconds. "This results in more timely and accurate reporting of position location information," Forgach states. The JCR allows access to the Type 1 secret network through the KGV-72 encryption device. With the capability, users can send secret data even while on the move and can interoperate with command posts.

Maj. Gregory Johanek, USA, Eighth United States Army communication operations chief, says the encryption is the biggest difference between the previous system and the new capabilities. Soldiers in the Eighth Army in Korea received the technology first, and they already have fit more than 1,000 platforms with the upgrades, including delivery to the 2nd Infantry Division, the major ground combat unit in the Asian nation. Fielding starts this month in Afghanistan, where more than 13,000 platforms are scheduled to receive the advanced features. The JCR most benefits Eighth Army operations by increasing both the security level and protected nature of blue force tracking.

Originally, all the upgrades were scheduled for delivery to Korea in fiscal year 2013, but the Eighth Army requested the JCR delivery early to facilitate training on the advancements prior to

achieving full operational capability in 2015. The organization has a requirement to use the Combined Enterprise Regional Information Exchange System Korea (CX-K) coalition network to share information with United States Forces Korea as well as the Republic of Korea Ground Component Command. "The Army granted this acceleration request in order to provide U.S. forces with enhanced command and control, imagery, messaging and position location information capabilities on the CX-K network," Forgach explains. However, no interface exists yet between the JCR and exchange system. The PEO C3T is working on a technical solution that it will deliver and implement.

The cross-domain solution from the secret Internet protocol router network, or SIPRNET, to the information exchange system in Korea is the key to maximizing the value of this communications traffic. The JCR improves the ability to communicate overall by streamlining "the data flow by starting and ending on a classified network, instead of having to travel through a 'filter' that takes the information from an unclassified network to a classified one," the major explains.

At the beginning of this year, Eighth Army transitioned from the U.S. Army Service Component for Army forces on the Korean peninsula to become an operational-level field Army headquarters with command and control responsibilities in the region. This change necessitated a number of fielding and system upgrade accelerations, including the JCR. The early fielding focuses on training soldiers for familiarity with the new equipment as quickly as possible. Expanded deployment to units in Afghanistan will not affect troops in Korea unless the former units transition to the peninsula.

The FBCB2 side of the technology also improves with the implementation of the JCR. A new map engine and enhanced navigational tools are included along with a self-descriptive situational awareness feature. By employing that tool, units can change task organization in the field, adapting their systems to changing conditions on the battlefield. The JCR also integrates other military technology into the systems it is designed to enhance. The Tactical Ground Reporting Web-based tool is co-hosted on all the JCR platforms and systems. Lower-echelon soldiers can use it to collect, share and analyze information via an interface similar to Google Earth, pictures and text. Troops can assess historical data and event analysis on their own during mission execution rather than within the command post.

Logistics will be enhanced with the capabilities release as well, an improvement that foreshadowed recent comments by Frank Kendall, the undersecretary of defense for

acquisition, technology and logistics, that the logistics of leaving Afghanistan will be more complex than he previously expected and more difficult than during the end of major U.S. troop presence in Iraq. JCR-Logistics (JCR-Log) integrates FBCB2/BFT capability with the Movement Tracking System (MTS), a vehicle-based system that tracks combat support and combat service support vehicles, as well as other assets. "It offers a radio frequency identification capability to provide in-transit, real-time visibility of critical cargo," Forgach says. "The MTS JCR-Log provides the technology necessary to communicate with and track tactical wheeled vehicles and cargo in near real time, enabling the safe and timely completion of distribution missions in support of full-spectrum operations. The upgraded capabilities result in a seamless, two-way situational awareness and message exchange between convoys and the maneuver formations to which they are delivering goods."

In addition, soldiers will enjoy new chat function and instant-messaging capability, which Forgach says are user-friendly mechanisms to communicate in real time. "These new chat capabilities are the only ones found down at platform levels, on the move and in a secure domain environment," he explains. "Other chat capabilities are inherently command-post-based." Before fielding of the JCR began in Korea, the Army tested it at Network Integration Evaluation (NIE) 12.1. The NIEs are a series of soldier evaluations designed to field necessary and immediately functional network pieces more quickly. Forgach says the chat addition to the platform was well-received by soldiers in the evaluation. Units quickly adopted the capability for real-time coordination during their missions.

> "These new chat capabilities are the only ones found down at platform levels, on the move and in a secure domain environment."
>
> *—Jeff Forgach, chief, readiness management, Joint Battle Command–Platform, PEO C3T*

The numerous features added to the tracking systems already in use in Korea will enhance operations through better communications. "Soldiers will experience faster, better data exchange and collaboration on the coalition network as they integrate the new capabilities into their mission on the peninsula," Forgach states.

In part, the Army's focus on faster technology deployment through the NIEs made the faster fielding of the JCR's various upgrades possible. Forgach explains that, "We were able to balance our priorities and employ a 'crawl, walk, run' strategy in the context of our overall fielding plans and the Army's network modernization strategy." The network evaluation last fall marked the crawl phase. Fielding in Korea served as the walk stage, and the Afghanistan deliveries of the JCR initiate the run phase. In addition to work by the PEO C3T, the Army G-3/5/7 LandWarNet/Mission Command Directorate, Army Materiel Command and the Communications-Electronics Life Cycle Management Command all played roles in the effective delivery of these capabilities.

Multi-disciplined teams deployed to Korea to conduct integration efforts. The enhancements will be installed on all wheeled and tracked vehicles employed by the receiving units except for tanks and Bradley fighting vehicles. The majority of platforms receiving the new capabilities are the M1151 enhanced armament carrier-modified Humvees, the M1025 armament carrier configuration Humvees, the M113 armored personnel carriers and the M577 command post vehicles. Forgach says that program personnel also are installing the JCR on some mine resistant ambush protected vehicles because of that platform's emerging company intelligence support team, or COIST, mission.

During the fielding in Afghanistan, the multi-disciplined teams are traveling to the Operation Enduring Freedom theater to conduct integration efforts as required, Forgach states. Personnel will need to integrate the capabilities onto combat platforms acquired by units as theater-provided equipment—equipment left behind by other units formerly operating in the area.

Despite the climatic differences between Afghanistan and Korea, no alterations are necessary to employ the capabilities in one country or the other. "The BFT 2 satellite network allows connectivity in a variety of geographic locations," Forgach explains.

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WEB RESOURCES

Joint Battle Command-Platform: ***http://peoc3t.army.mil/fbcb2/jbc-p.php***

Eighth Army: ***http://8tharmy.korea.army.mil***

NIE: ***www.bctmod.army.mil/nie_focus/index.html***

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A Different Type of Self-Forming Network

People, not necessarily technology, come together in a plan to foster creativity in acquisition.

An explosive ordnance disposal (EOD) technician with the 2nd EOD Company, 8th Engineer Support Battalion, inspects an improvised explosive device (IED) after it was blown up in place in Urmuz, Afghanistan. The Joint IED Defeat Organization is fostering an innovation engine that will help deliver better solutions for counter-IED missions and information technology.

By Rita Boland

The head of technology information at the Joint Improvised Explosive Device Defeat Organization has initiated a plan to improve how coalition members procure capabilities by focusing first on personnel, not technology. Through the new approach, government, industry and academia will re-frame conversations and have more meaningful dialogues, which should lead to deploying apt solutions more quickly.

Leveraging his position in an agency built on agility, Jim Craft, the chief information officer (CIO) and deputy director information enterprise management at the Joint Improvised Explosive Device Defeat Organization (JIEDDO), is reaching out to partners across the spectrum. His goal is to alter how they purchase or pres-

ent materials in the hopes that lives will be saved and innovation will be rewarded. The idea has particular relevance to counter improvised explosive device (IED) and information technology operations and should foster creativity, eventually leading developments into the best funding streams.

Craft calls his plan for this rapid acquisition process the innovation engine. In formal terms, he explains that it "is a systematic, disciplined approach to leverage self-forming networks among coalition partners and in the private sector and the whole of government in order to discover and encourage innovation, then rapidly adapt that innovation to support the JIEDDO mission and where appropriate the information technology support of our warfighters."

However, Craft is eager to spread his message in more informal language. In the case of his organization, the engine will further the overall mission to attack the network, defeat the device and train the force, which demand knowledge, information sharing and creative development. JIEDDO is looking beyond only IEDs to determine solid methods for conducting federal information technology such as cross-domain work, cloud computing, large data issues and analytics. Though the efforts do not tie directly to explosives in the field, quality information technology systems support counter-IED operations.

"We are innovating, and the bad guys are innovating," Craft states. "It's our innovation cycle against their innovation cycle." His work experience has given him perspective of the issues from various vantage points. In addition to high-level positions in industry, he served as the deputy CIO for the U.S. Marine Corps and as the senior telecommunications adviser for the Afghanistan Reconstruction Group under the U.S. State Department.

"If you can do your cycles faster than they're doing their cycles, you beat them," Craft explains. To stay ahead of enemies, coalition partners need better solutions, but they also need to deploy them before the enemies can advance their operations to the point that solutions are outmoded. The self-forming-networks idea steals strategies from the jihadists' own playbooks. Terrorist groups often operate by putting out messages to motivate people toward a goal, then stepping back and allowing them to make their own implementation decisions.

Bringing the right people together early to share and develop true, meaningful requirements and capabilities encourages innovation in the right direction. Potential partners in this process include not only traditional government and industry, but also academia, associations, nongovernmental organizations, federally funded research and development centers, national laboratories, mentoring authorities and associations—basically anyone who is willing to contribute meaningfully by working with others.

Liaison officers are searching out candidates, but the organization as a whole is not spending large amounts of money on the work. Craft has made two significant personnel moves, creating a deputy CIO for information technology innovation and a deputy CIO for enterprise performance and optimization. The purpose of the former is to introduce new methods of doing business into the computing-technology acquisition cycle; the latter focuses on continual process improvement and deliberate choices. "It's like yin and yang," Craft explains.

The shift in thinking necessary for the innovation engine to proceed may seem minor. It follows what theoretically has been the process for decades—government tells industry or academia what it wants, and developers respond with solutions options. But more discussions in the coalition environment are centering around the flaws in this approach. The government does a poor job of defining and even knowing what it really needs and of fielding technologies in a useful timeline. In the end, often technologies warfighters receive are outdated, incompatible or, in the worst case, useless.

Efforts have been made across the U.S. Defense Department to remedy the problems through acquisition reform. Craft says the innovation engine provides a structure for showing how all the people who have a role to play fit into the process. The engine follows all the rules of the current acquisition process but helps break down certain miscommunication points.

Dr. Linton Wells II, director, Center for Technology and National Security Policy, National Defense University (NDU), believes that the innovation engine will help facilitate the right discussions as well as the right mindsets. "You never learn a lesson until behavior changes," he states. JIEDDO and the NDU are collaborating on a number of projects including the innovation engine. Wells says groups involved with the latter want to see alterations across the doctrine, organization, training, materiel, leadership and education, personnel and facilities spectrum, finding ways to fold the engine into the experimentation process. Wells—who has served as the principal deputy assistant secretary of defense (networks and information integration) and as the acting assistant secretary and Defense Department CIO—says that though people have been talking about this for a long time, now there is a new, energetic

Driving Reasons for Developing the Innovation Engine

According to Jim Craft, CIO and deputy director information enterprise management at JIEDDO

1. Innovation is key to saving lives. "When coalition partners, and others who support them, innovate well, they might be saving a dozen or more lives."
2. The country is in really rough economic times. "One way to spend your money more productively is to innovate. Because of the economy, we have to be better at innovating to realize more capability for less money."
3. "Yankee ingenuity" and U.S. inventiveness helped make the country a global leader. "We have to foster innovation, not just acknowledge it...but to promote and implement innovation for a specific outcome—a desired strategic effect. That is what JIEDDO is all about."

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leader at JIEDDO doing more to move the ideas forward in his short tenure than most other organizations.

A large part of the innovation engine is for government to tap into the energy, initiative and speed of the private sector while keeping a balance of responsibility. Industry and government must reconcile their different working views. Companies understand well near- to mid-term changes, while government has to budget for the mid- to long-term. To succeed, the public sector must better articulate its needs based on more sophisticated project models, and the onus of the effort is on government personnel to define in meaningful terms what capabilities they really want and need.

Different considerations for the same projects are important discussion points that the innovation engine could facilitate. Wells explains that many issues are outside of industry thought processes. Government involvement in development conversations can lead to more robust solutions.

Craft and his partners are working hard to ensure chances for small businesses to participate. "A lot of small companies feel they're squeezed out," he explains. One solution he envisions involves meetings at conferences where some JIEDDO officials sit down with members of this group who tell them specifically what problems they encounter trying to do business. Looking at the larger picture, organizations could offer each other benefits in many ways. For example, conferences could include data sheets about the specific wares exhibitors are bringing to a show, so government officials can spend their time visiting the right booths and not wasting anyone's time.

Government personnel who become part of the innovation engine are not asking industry for free work. Rather, if creative developers want to focus on a certain problem, the tool helps connect them with good ways to approach government with their offerings, giving the public and private sector better options.

Instead of following the old process of "request, response, contract," the engine will foster innovation for products the government might want. This could happen through various forums, such as workshops at universities, as long as the focus remains on maintaining a level playing field. "We're working closely with the lawyers to do this," Craft says. The dialogue will help people selling technology to find the right funding. For JIEDDO, the goal often may be to find the solution then turn it over to other organizations.

Beyond seeing the process in a new manner, organizations that become involved may have to view the end differently as well. "People need to look at the bigger picture and understand that we're about saving lives," Craft states. He adds, "If they're interested in the warfighters, this is more for them. If they're more interested in the market share, this probably isn't their cup of tea." He believes the innovation engine is for individuals who understand the direction of the 21st century.

Fortunately, many people who develop technology for the military have a passion for supporting troops downrange: many of them are or were in uniform themselves. But all change involves pushback. "This is not the comfortable way of doing business," Craft states. "Sometimes it's scary, and it's exhausting."

The current defense environment offers many reasons for

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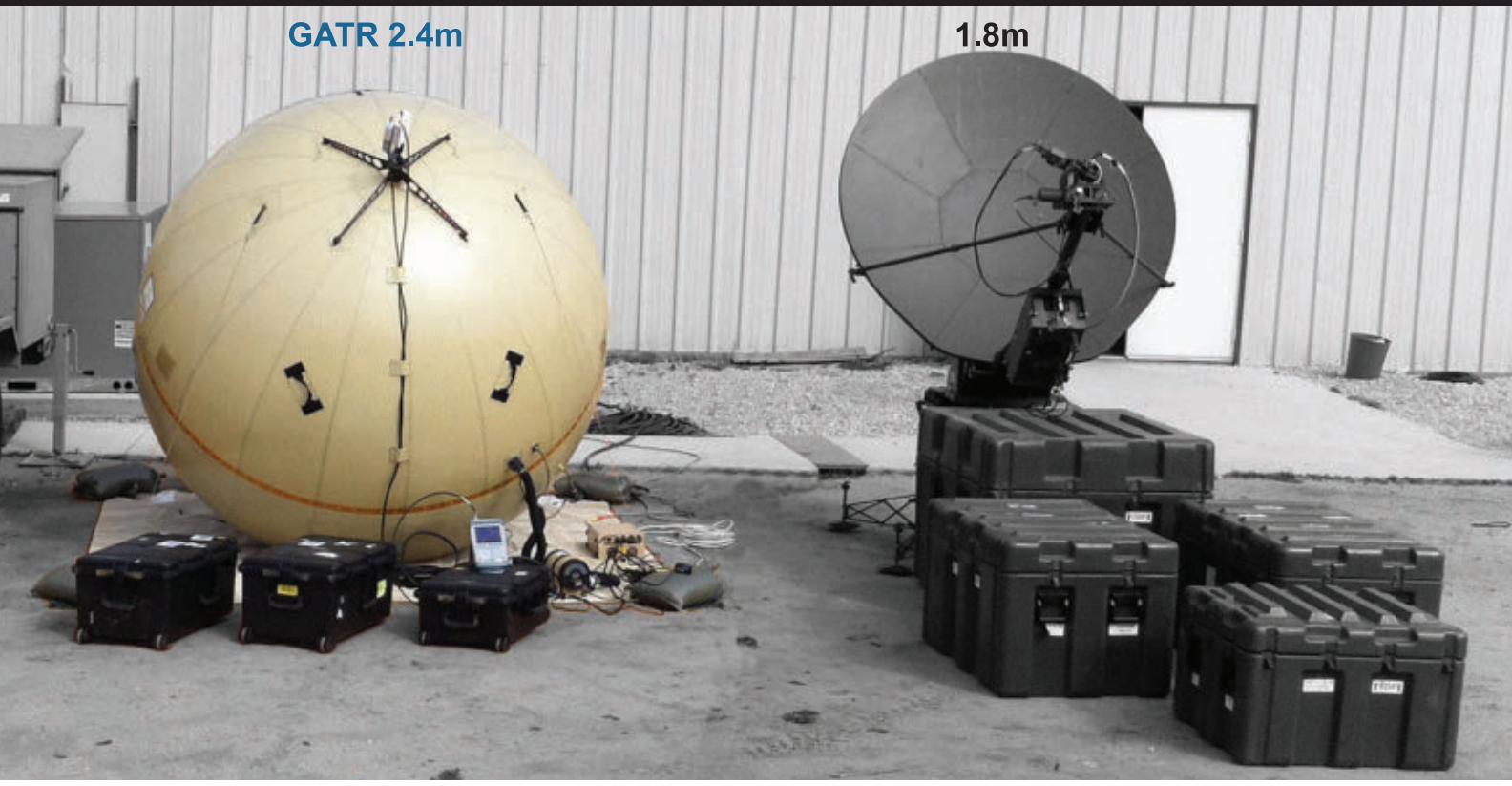

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implementing acquisition changes now. Because IEDs are a fast-evolving danger that have been the major cause of casualties in Iraq and Afghanistan, as well as their prevalence worldwide, Congress gives JIEDDO certain support, latitude and funding benefits, making the organization a natural leader for innovation. Also, Craft believes that the United States has grown weary of battle. "It's a war of attrition of will," he explains, in which spirit has worn down. He hopes that through the innovation engine people who still care and want to make a difference will form networks with opportunities to put forward ideas.

One of the major drivers of change is the topic coloring almost all current military conversation—significant funding cuts. "Bad times force people to get out of old habits ... budget reductions force people to break iron rice bowls," Craft says. Wells also believes that the austere fiscal environment can help drive meaningful change in acquisition.

Asymmetric warfare serves as a change agent as well, demanding a different response than traditional warfare and coming back to the need for potential partners to engage in self-forming networks. Current threats such as IEDs and cybercrime require little infrastructure or personnel to cause damage, and perpetrators are difficult to track. The two fields have many similarities, both using networks to cause multiple problems.

For now, Wells says "I think it's a win-win to explore" the innovation engine. A possible detriment he foresees is if the government transitions to a commercial product cycle without thinking through longer-term requirements of how missions will evolve. The public sector needs to find the right combination of giving warfighters the tools they need to do their missions in timely manner without making boots on the ground the beta test groups for technologies.

The project also requires measurements and metrics for various mission areas in place from the beginning to understand success or failure, Wells states. With the ultimate goal of supporting the warfighter, innovation-engine teammates must listen to what they need then understand if the process did improve operations at the pointy end of the spear.

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WEB RESOURCES

JIEDDO: ***www.jieddo.mil***

NDU Center for Technology and National Security Policy: ***http://www.ndu.edu/inss/index.cfm?type=section&secid=53&pageid=4***

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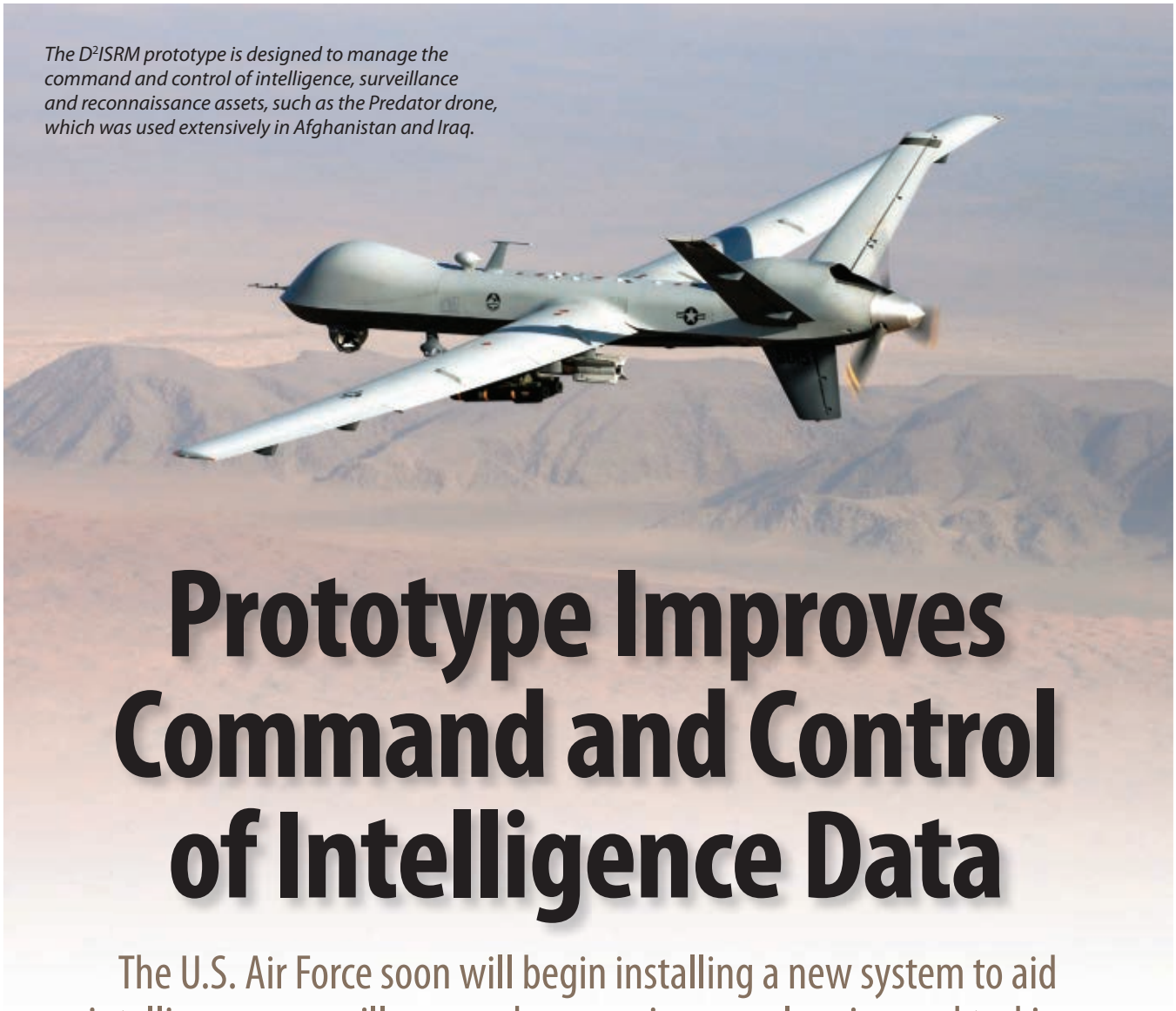

The D²ISRM prototype is designed to manage the command and control of intelligence, surveillance and reconnaissance assets, such as the Predator drone, which was used extensively in Afghanistan and Iraq.

Prototype Improves Command and Control of Intelligence Data

The U.S. Air Force soon will begin installing a new system to aid intelligence, surveillance and reconnaissance planning and tasking.

BY GEORGE I. SEFFERS

Possibly as early as this month, U.S. Air Force officials will begin installing a prototype system that supports the command and control of intelligence, surveillance and reconnaissance information. The system dramatically reduces manual labor and cuts the planning development process from hours to minutes, allowing warfighters to focus on the mission.

The Deliberate and Dynamic Intelligence, Surveillance and Reconnaissance Management (D²ISRM) system provides more machine-to-machine communication, reducing the slow, manual work involved in planning and assigning tasks for ISR assets such as Predator, Reaper and Global Hawk unmanned aircraft. The D²ISRM is expected to begin a "limited early install" into the Air Force's Air and Space Operations Center Weapon System (AOC WS), reveals Perry Villanueva, program manager of the Air Force Command and Control (C^2) Constellation program at Hanscom Air Force Base, Massachusetts.

The AOC WS is the Air Force's command and control center for planning, executing and evaluating joint air operations during conflicts. Earlier this year, the service awarded a potential $504 million contract to Northrop Grumman Corporation's Information Systems sector, McLean, Virginia, to modernize the AOC WS. The modernization effort will move the operations center to a single computing environment, eliminating the need for warfighters to search myriad systems for different types of information, enhancing the speed of command and enabling more effective mission planning and execution.

The limited early install is a risk-reduction effort intended to test new capabilities for the operations center. "We expect that by participating in the limited early installation, D²ISRM will gain more exposure with the operations world and that it can then be

matched up with an appropriate program of record to fully transition the effort," Villanueva states. "Work is still ongoing to find a program of record to transition this capability."

Currently, as operators receive various ISR requests, they have to consider a wide array of variables, including which assets are available and mission appropriate, as well as combat conditions, such as weather and the locations of hostile forces. Essentially, the system narrows down the available options so that warfighters can make more informed decisions at a faster pace.

The system works with both deliberate and dynamic command and control. "Deliberate command and control of ISR planning is done on a daily basis to build an overall ISR plan. These plans can be quite complicated, as they involve many assets, airspaces, collection targets and so on. The plan must orchestrate all of these variables in order to maximize collection coverage and sensor utilization," Villanueva explains. "Dynamic command and control occurs when the deliberate plan must be disrupted because of changing needs—for example, an emerging high-priority collection target. The ultimate goal of dynamic ISR management is to make changes that service the new collection while minimizing perturbations to the rest of the plan."

The Reaper was one of the aircraft, along with Predator and Global Hawk, used to demonstrate the D²ISRM prototype earlier this year.

The D²ISRM prototype was evaluated earlier this year during an operational demonstration. For demonstration purposes, warfighters from the 102nd Air Operations Group at Otis Air National Guard Base, Massachusetts, simulated an intelligence cell and found that the system significantly decreased data processing time. "D²ISRM has the potential to work with a wide variety of piloted and unpiloted ISR. In the April

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operational demonstration, however, we bounded the prototype to Predator, Reaper and Global Hawk aircraft to limit the development complexity," Villanueva says.

For the demonstration, the team compared the D²ISRM process with current manual processes. For deliberate planning, players using the manual process were stopped after 4.5 hours, although they reported needing more hours to complete the ISR plan. Players equipped with the D²ISRM were able to complete the plan in less than 30 minutes. For dynamic planning, Villanueva describes three ad hoc ISR task requests. During these stages, the time was cut by at least one half. For the first task, the manual process took 10 minutes; the D²ISRM took five. For the other two tasks, the comparative times were 23 minutes versus three, and 33 minutes versus two.

The D²ISRM involves several components, including Perceptual Sensing and Information Displays (PERSEID). Built by Charles River Analytics Incorporated, Cambridge, Massachusetts, PERSEID enables the simultaneous display of deliberate and dynamic ISR data and uses decision-support algorithms to enhance ISR command and control. Villanueva's C² Constellation program is developing PERSEID along with the Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio.

Simply put, PERSEID makes decision making a little easier, Air Force officials say. Each day ISR collection planners have to figure out how to orchestrate the missions of many aircraft to reach their collection targets at the appropriate times and under the right conditions. In addition to figuring out the times and flight paths, they also have to define the plan for potentially many sensors onboard each aircraft, all of which can be incredibly complex. "The options engine within D²ISRM is able to quickly optimize a collection plan within a set of constraints—for example, the amount of coverage, the number of sorties and priorities. The net result is a collection plan that is more effective and that has been generated more quickly," Villanueva elaborates.

The D²ISRM prototype has its roots in the Maestro project, a core C² system for Predator and Reaper aircraft. Later, the C² Constellation program staff collaborated with an intelligence officer who recently had served at the Combined Air Operations Center at the Al Udeid air base in Qatar to improve an existing manual process for dynamic tasking of Reaper aircraft. The improved system placed intelligence data used by the command center senior intelligence duty officer into a Web service and integrated a map interface using Google Earth to show asset location information.

Last year, the team identified PERSEID as a potential cornerstone for the D²ISRM. One of the challenges was

that PERSEID focused solely on ISR planning, meaning the team had to do significant work to make it support dynamic ISR requirements.

The C² Constellation program, under which D²ISRM is being developed, began in 2001. It is the sole Air Force program for defining, developing and assessing integration of global, theater and tactical-level Air Force air, space and cyber command and control capabilities in support of the warfighter, Villanueva reports. Through funding and management of targeted prototyping and experimentation, the program integrates rapidly developing technologies and promotes forward-looking architecture, common standards, data sharing and information services across the service and joint warfighting applications.

The program consists of two components: horizontal integration and Joint Expeditionary Force Experiments, each of which has its own funding. The first focuses on identifying and improving integration opportunities, while the second focuses on providing prototypes to warfighters for experimentation purposes.

Specifically, the C² Constellation program focuses on prototyping efforts that fill gaps between existing programs of record. The C² Constellation program is uniquely tasked to find and address those gaps, Villanueva maintains.

The Air Force Life Cycle Management Center Architectures and Standards Division at Hanscom Air Force Base, and the Air Force Command and Control Integration Center at Air Combat Command, Joint Base Langley-Eustis, Hampton, Virginia, work together to execute the program. The command and control integration center sets the requirements and focus areas for each year's work while the architectures and standards division develops materiel solutions.

The integration center identified command and control integration as a focus area for 2012, and the D²ISRM initiative was taken on as part of the mission to fill gaps in the command and control of ISR. "We viewed D²ISRM as a good candidate because ISR planners desperately need some assistance in order to be more efficient and effective, and the task was fairly straightforward," Villanueva says. "In short, this kind of low-hanging fruit is precisely the kind of cross-functional, targeted, high-payoff initiative the C² Constellation [team] likes."

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WEB RESOURCES

D²ISRM: ***www.af.mil/news/story_print.asp?id=123304653***

C² Constellation: ***www.dodccrp.org/events/2004_CCRTS/CD/papers/164.pdf***

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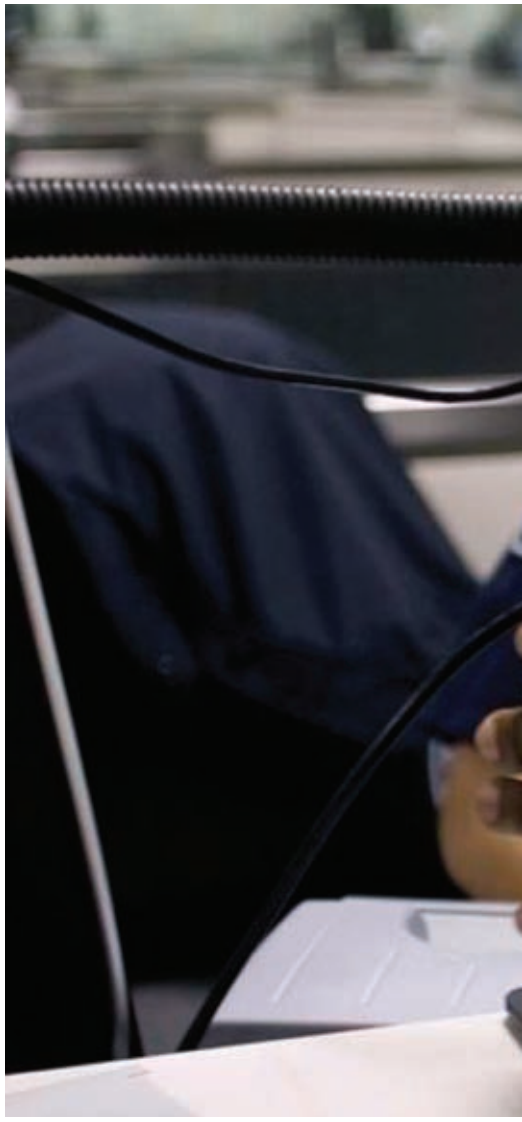
Managing Change in the Intelligence Community

A new computing architecture emphasizes shared resources.



BY MAX CACAS

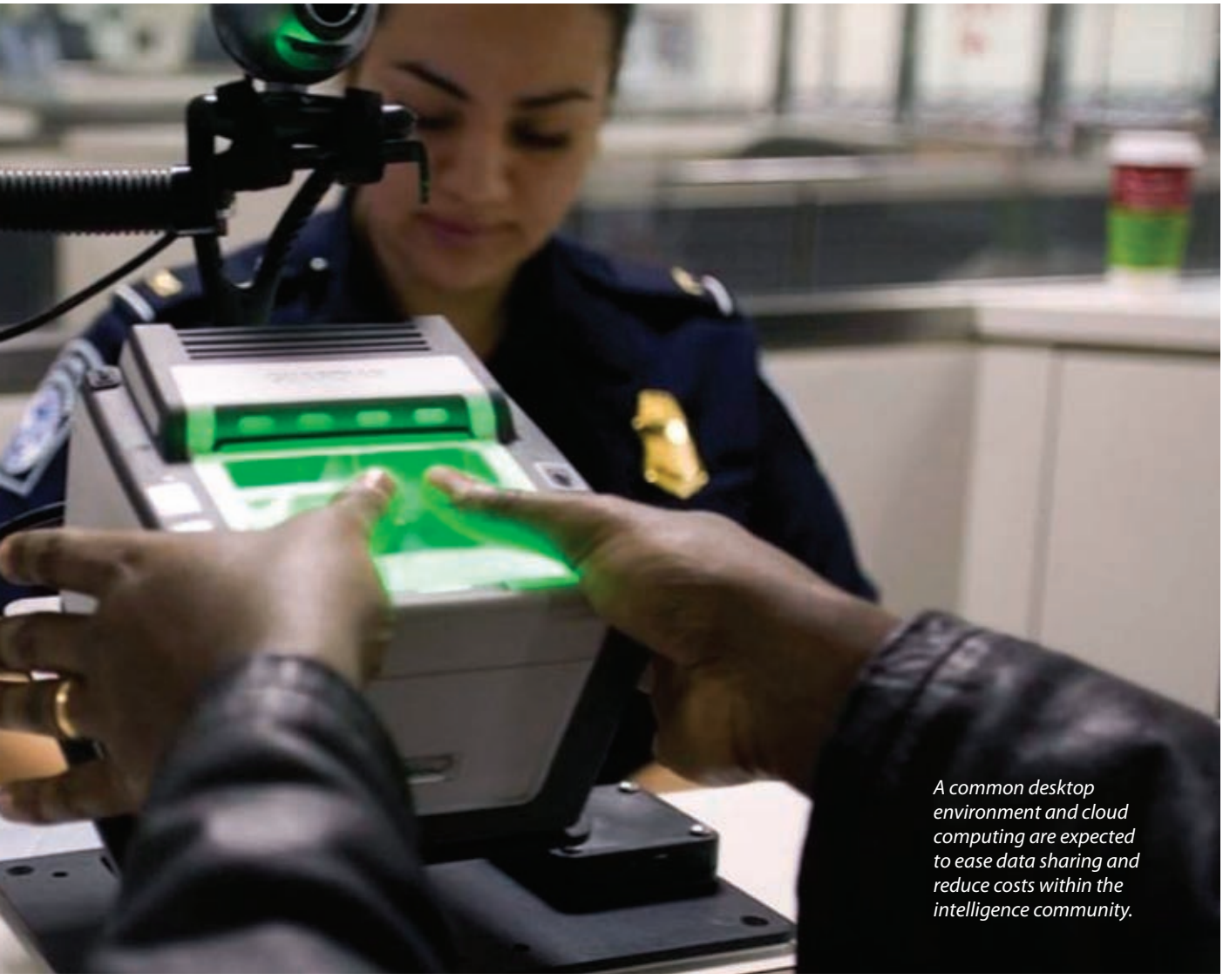
The nation's intelligence community has embarked on a path toward a common computer desktop and a cloud computing environment designed to facilitate both timely sharing of information and cost savings. The implementation could result in budget savings of 20 to 25 percent over existing information technology spending within six years, but the ramifications could include large cultural changes that result both in lost jobs and business for industry partners.

Al Tarasiuk, chief intelligence officer for the Office of the Director of National Intelligence (ODNI), explains that the changes will be difficult. Agency employees, and the vendors who help operate and manage information technology for the 17 agencies composing the nation's intelligence apparatus, will feel the effects of the cost cuts.

"Right now, technology is not our biggest risk. The culture change is our biggest risk, and that extends to our industry partners. We have a lot of industry employed in the community through service contracts and other things. They could help, or they could choose not to help," Tarasiuk emphasizes, candidly describing the pivotal role of these firms in a transition that could spell the loss of both business and jobs. "They know, and I've been very open with them, that we're not going to need the pool of resources of people that we have today to manage what we have in the future."

The idea behind shared information technology platforms, which has been a trend in other parts of the federal government and private industry for nearly a decade, is to drive down labor costs, Tarasiuk acknowledges. "What I've said to industry is that we need help in figuring out how to get there; we need their cooperation, even though they know that at the end of this, they may not have as much business with us as they have in the past."

He warns that, "Those who choose not to support us here, who choose not to deal with the cultural changes within their own organizations, or the people who are deployed in their own organizations that might cause issues for us, they may not get the business in the future."



A common desktop environment and cloud computing are expected to ease data sharing and reduce costs within the intelligence community.

The change that Tarasiuk and his colleagues have been mapping out includes a number of information technology initiatives designed to facilitate data sharing more readily and to reduce costs drastically. They include providing a standard, thin-client desktop for most users in the intelligence community; integrating cloud computing technologies and architecture that allow interoperability with other clouds; streamlining networks and simplifying existing software applications; consolidating supporting infrastructures; and finally, designing a consolidated back-office and desktop environment to support the new architecture.

The initiative, known as the Intelligence Community Information Technology Enterprise (ICITE), was announced in fall 2011, several days after Director of National Intelligence James Clapper announced budget cuts of more than $10 billion to the intelligence agencies. As much as half of those savings are to come from information technology budget items.

The idea behind shared information technology platforms, which has been a trend in other parts of the federal government and private industry for nearly a decade, is to drive down labor costs, Tarasiuk acknowledges. His previous job as chief information officer at the Central Intelligence Agency (CIA) has given him perspective on how much can be saved through consolidation. "Having come from the agency, I knew already how much cost we have driven out by virtualizing, by going to standard desktops, and I knew that other agencies had done similar things."

The concept of the new intelligence community computing environment is "build it once, and share among all of us." Cloud computing, which will be the foundation on which most of the new environment is being built, is the technology of the day. All the agencies either have moved in that direction or are positioned to move in that direction because of the work they have done in virtualization, Tarasiuk explains.

However, this project is not about cloud computing, per se, Tarasiuk points out. Rather, it is about "consolidating and creating shared capabilities and services that we can all use, and by using them, we can drive out costs,

"Right now, technology is not our biggest risk. The culture change is our biggest risk, and that extends to our industry partners. They could help, or they could choose not to help."

—Al Tarasiuk, chief information officer, Office of the Director of National Intelligence

and we can also integrate better." In addition, he sees this as an opportunity to make needed changes to the intelligence community's security architecture, but he offers no details on the nature of those changes.

There is "no secret sauce" to a common desktop or a consolidated computing infrastructure, Tarasiuk states. Such architecture is based on similar off-the-shelf hardware, obtained through standard contracts, and in some cases, customized for the special needs of specific agencies. "At the end of the day, there's no reason why we couldn't do it together," he says, explaining the rationale behind all the intelligence community agencies designing a shared computing environment. "We came up with some common principles, and one of those principles is to do in common those things that are commonly done."

The primary thrust of the shared computing environment

that is being designed is to create mission agility and flexibility at the application, or software layer, of the environment. "The CIA and the DIA [Defense Intelligence Agency] need certain types of technology and tools. There's no reason why they can't have their own for their specific operational needs. They need to optimize those."

Another benefit of the ICITE architecture, Tarasiuk notes, is that it is scalable and expandable to accommodate emerging and future requirements. For example, one of the latest concerns among Tarasiuk and his colleagues is how to handle big data, a term describing the voluminous amounts of information coming from satellites, unmanned aerial vehicles, underwater recorders and the whole range of electronic sensors gathering information around the world.

"I don't believe any one agency will ever have the resources to deal with the volume problem on its own. But in a shared environment, resources can be pooled and put into a shared infrastructure that can expand and contract. It is easier to expand and contract computing resources in a cloud environment," he explains.

Mindful of the missions carried out by his clients in the intelligence community, Tarasiuk says that another challenge in designing ICITE is in managing the information in a timely way. "We have to determine almost in real time, in a streaming format, whether that information is tipping and cueing information that needs to be sent out immediately. Or, is it information that can be sent back for deeper analysis?" The solution comes in being able to tag information quickly and properly, using such protocols as Extensible Markup Language, or XML, a spin-off of the same types of computer tags and coding that make possible the World Wide Web, Tarasiuk explains.

When information is tagged properly, it is clear where it is coming from and to determine its classification. Also key is "tagging at ingestion," he says. "You have to figure out a

More timely sharing of data among the agencies of the intelligence community is another goal of the new ICITE network architecture now in development.

way to tag these to standard formats and let the automation behind the scenes do a lot of that work for you." Tagged in this way, Tarasiuk explains, "We can associate information with the people who need to have the information. There will be more assurance over time that the right people are seeing the information."

The intelligence community chief information officers have adopted a service provider approach from among their number in parceling out the development and future management of the ICITE. The CIA and the National Security Agency (NSA) will design the integrated hosting environment, so jointly, they will provide cloud computing services to the community, including data, utility and storage clouds. The National Geospatial-Intelligence Agency (NGA) and the DIA will work together to be the lead for the desktop design.

The new architecture will be deployed to the intelligence community agencies in three increments. The first increment is scheduled for completion by the end of March 2013. At that point, one of the cloud environments, hosted by the NSA, is slated to be operational, along with the initial version of the common desktop environment. Tarasiuk adds that the DIA and the NGA will be the first agencies to deploy the common desktop.

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WEB RESOURCES

Office of the Director of National Intelligence: ***www.dni.gov***

SIGNAL Online, "Defense Intelligence Aims for Savings Via Reforms" (December 2011): ***http://bit.ly/sQZXdL***

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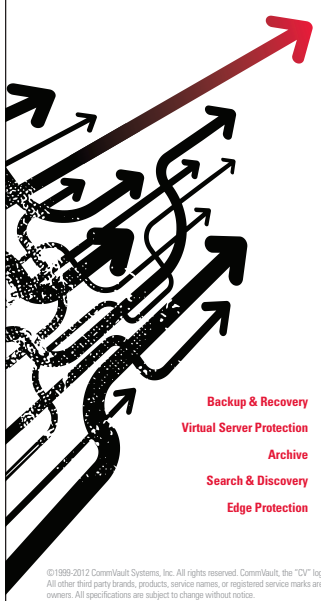

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Intelligence CIOs Teaming for Change

New common goals open doors for more efficient approaches to information sharing.

BY ROBERT K. ACKERMAN

Technological and cultural barriers are falling away as intelligence community organizations strive to establish a collaborative environment for sharing vital information. This thrust may be a case of an urgent need overcoming traditional obstacles as onetime rival groups embrace cooperation with the goal of building a synergistic information realm.

This effort comprises several initiatives that range from establishing a common information interface to moving to the cloud. Along with programs to meet technological challenges, the thrust has changed relationships among agencies and even the nature of some intelligence organizations.

These initiatives have brought the FBI back into the core of intelligence community information sharing. For several years, the bureau has been migrating toward becoming a domestic intelligence organization concurrent with its law enforcement activities. It faces different hurdles than those confronted by defense-oriented intelligence agencies, but some of the solutions realized by the bureau might be applied across the intelligence community.

Other organizations in the intelligence community are weighing different options. Their chief information officers (CIOs) are dealing with the challenges inherent in sharing information across organizational lines, but with different approaches that may based in part on whether they largely are the collectors or the processors. Regardless, the information technology element of the intelligence community is becoming more integrated, says Grant M. Schneider, deputy director for information management and CIO at the Defense Intelligence Agency (DIA).

At the forefront of the intelligence community's information sharing is the movement toward the cloud. This activity is part of the Intelligence Community Information Technology Enterprise, or ICITE (see page 46), effort. The CIA currently is in the acquisition process to provide a commercial cloud. The National Security Agency (NSA) will be the community provider for the government cloud. The DIA and the National Geospatial-Intelligence Agency (NGA) are providing the intelligence community with a common desktop environment. This effort has been underway for about one year, and the two agencies have formed a joint program office that aims to make the desktop environment capable of security testing by year's end. The initial operational capability will focus first on DIA and NGA customers and will be conducted in-house by the two agencies.

Schneider prefers to describe the common desktop environment as "an endpoint-agnostic computing environment." It encompasses office elements such as email, collaboration tools, voice, video, chat, home directories and shared files. He notes that the desktop environment will ride on part of the cloud environment, so it will be delivered wherever the customer may be. The DIA is working with the NSA and the CIA on how DIA-specific applications and capabilities will be part of this cloud environment. Dean E. Hall, associate executive assistant director and acting CIO for the FBI, notes that the bureau is looking to embed one of its people in the common desktop environment effort.

Within the ICITE program, agency CIOs have the authority to make their own implementation decisions. When it comes to design decisions, the CIOs are working with community joint engineering teams to develop and vet designs. If any serious disagreement cannot be worked out at the joint level, then Office of the Director of National Intelligence (ODNI) CIO Al Tarasiuk would referee the issue.

The establishment of a common domain name was one such issue. Fueling this discussion was the recently established Common Operating Environment (COE), which started out three years ago as an initiative launched by the directors of the National Reconnaissance Office (NRO), the NSA, the NGA and the DIA. Later, the CIA was added, and the group built a domain and a proof of concept in February 2012. The issue was whether to leverage the COE or the ICITE as a naming convention. Ultimately, Tarasiuk opted to use the established COE approach as the domain—coe.ic.gov.

The NRO's move toward cloud computing has picked up momentum over

the past year, notes Jill Singer, NRO CIO. The office has its own internal cloud, known as Central Park, now undergoing beta testing. With its unique missions, the NRO needs to determine exactly where commodity cloud computing will work for it and where the organization's own applications preclude the use of commodity cloud computing.

Several issues led to the NRO building its own private cloud. Singer admits to a cultural reluctance by the NRO Top Secret community to accept the idea of a commercial provider managing vital data, particularly in terms of performance and availability requirements. That was overcome by adopting the internal approach. The NRO also opted to use a traditional commodity approach that favored using common vendors instead of constructing a unique and unusual set of cloud capabilities. This overcame integration challenges that might have arisen if the government organization had done the work.

Singer allows that the NRO is involved in other cloud-related activities. The office is looking at using graphics processing units for high-performance clouds instead of central processing units, and this effort also will help determine which technologies the NRO will need to push for meeting unique requirements.

Nonetheless, NRO officials believe that their organization will be a player in intelligence community clouds as they come online. That will allow the NRO to deliver its collected information quickly to its primary and secondary customers.

"We see cloud computing as an absolute feature for our future," Singer states. "Not just because the industry is going there, but because [cloud] has unique characteristics and capabilities that we can leverage for our operations across the United States and elsewhere."

Because the FBI operates in three different domains, its approach to cloud computing is multifaceted. FBI officials meet weekly with the CIOs of other organizations, and one bureau employee is deployed to the NSA in the cloud initiative.

Hall explains that the FBI's Top Secret cloud environment is being driven by the ICITE. The bureau is completely replacing its Top Secret environment, and Hall states that this effort is well along. The headquarters area already has been converted, and that effort now has been extended to field offices. Some elements are applicable to other intelligence agencies.

"We're not locked into a legacy environment now that would've created some real challenges for us to move forward," he says. "We can readily adopt these [ICITE] changes, and we've offered that to the ODNI ... to pilot some of these features."

Dean E. Hall is the associate executive assistant director and acting chief information officer for the FBI.

One cloud feature the bureau has adopted is cloud printing. An agent can go to any field office, log into a printer, and tap the cloud to print out a document on site. The file is removed from the printer system after a period of time.

Yet, the bureau is not rushing blindly into the cloud. "Cloud requires a very direct approach in that, if you rush into it, you can find yourself in an area of potential failure," he warns. Accordingly, the FBI has taken a methodical approach that began with virtualization.

Hall allows that the Secret realm is the FBI's "heavy-lift environment." For unclassified information, the bureau still is determining whether to outsource or insource. Return on investment will be a key factor in that determination, along with security needs. Hall relates that many vendors offer "FISMA-moderate" solutions relative to the Federal Information Security Management Act of 2002. The FBI needs "FISMA-high" solutions, and these offerings are very limited. The availability of FISMA-high solutions may be a factor in whether the bureau outsources unclassified information.

"With access comes the need for security, obviously," Hall observes. Tagging data, along with decisions on legacy data versus new more-easily tagged data, must be addressed. And, identity management will be an issue. Hall allows that the effort is driving toward attributes.

"Through the cloud initiative, data will become more readily available to those who have a need," he predicts.

The FBI faces somewhat different challenges as it shares its intelligence information with other federal agencies. The Justice Department bureau faces many statutory restrictions on which information it can share with other non-law-enforcement organizations. And, its type of information tends to be atypical of that sought by defense-oriented intelligence agencies. Yet, some of its data can be vital to national security when consolidated with that of the other groups, so information-sharing efforts must be allowed to bear fruit where useful and legal. While it is part of the nationwide intelligence community sharing effort, the bureau also must continue to share information with more than 18,000 law enforcement organizations.

The big challenge for the FBI will be in how it tags data, not how it shares information, Hall offers. The bureau is focusing on making as much information available as possible without affecting privacy or civil liberties. Redaction is part of this effort, he notes, as some information can undergo a litany of review that includes determining its pertinence. Some data may be removed so that a larger amount of information can be accessed. Yet, the majority of the bureau's information will be made as accessible as possible. Automated tools that assist analysts in making necessary

determinations will help enable these deletions without slowing the process.

Rapidly moving data between classified domains is another bureau focus. Users must be able to share information "downward and upward," Hall says.

Mobile technologies will be playing a major role with FBI agents in the field. Mobile devices have had a strong presence with the bureau, and it is exploring other opportunities to exploit the technology. Much of this effort focuses on pushing intelligence and other information out to the field, rather than just importing it from agents. Hall relates that the FBI is partnering with the NSA on how to share classified information with its field agents. Success in this realm could allow the bureau to free itself from some of the infrastructure within its buildings, he notes.

Even though the FBI serves both intelligence and law enforcement missions, it does not want to build two different information environments, Hall emphasizes. It seeks to leverage technologies from the commercial sector and from other government organizations. The NGA is placing its information online, and the program manager for that effort was embedded for two years in the FBI's geospatial branch, which is helping the bureau's efforts.

Hall offers that the goal would be for agents to access both the unclassified and Secret networks via a tablet. He does not foresee moving the Top Secret environment to the tablet yet because of physical security controls. Another challenge will be how the FBI manages its app store, he says.

Intelligence organizations have different perspectives about the progress of information-sharing efforts. Hall believes that information sharing among the elements of the intelligence community is going well. Good relationships exist among the different CIOs, and they are well-supported by their organizational leadership.

He continues that the biggest changes will occur early in the ICITE process, citing the NSA's intelligence community applications model as a prime example. This will enable the different agencies to share applications for information sharing as well as manage how they address data in their analyses. "Rather than each of us using our independent tools and services, we'll actually be sharing that—so it will be a common element across the board," he points out.

"I see us continuing to focus on having to do information sharing and having to do it in a manner that is secure and auditable to the maximum extent possible."

Grant M. Schneider, the deputy director for information management and CIO at the DIA

The NRO has been shipping its intelligence product to a broad range of customers, including other intelligence agencies and warfighters. So, intelligence sharing is not a new concept. What is new is that the NRO is working on multi-INT production in-house closer to the collection end of intelligence processing. According to Singer, the goal is to be able to add other intelligence data early in the process. This will provide greater value to the information the office passes on to most of its customers, instead of disseminating the data only to the NSA or the NGA for those agencies to add value to the data.

Sharing among the intelligence agencies has been affected by issues surrounding Wikileaks, Schneider allows. Immediately after the first revelations, the community experienced a fear that the pendulum for information sharing would swing back toward security. However, he says, the renewed focus on securing information and sharing it correctly is coupled with a continued desire to "push the envelope on information sharing," without a return to need-to-know over need-to-share. "I see us continuing to focus on having to do information sharing and having to do it in a manner that is secure and auditable ... to the maximum extent possible," he posits. As security controls are enhanced, the community will have more fidelity in how it is sharing information and what happens to the information as it is shared.

Schneider continues that his counterparts across the community are focused on the need to share information. However, they acknowledge that some information must be restricted through activities such as special access programs. The CIOs must provide information technology solutions that will allow intelligence organizations to both share and restrict information. This might entail allowing all information to be discoverable by everyone without being available to all.

Hall echoes Schneider's concerns about how Wikileaks is affecting information sharing. The FBI is focusing on computer network defense and insider threats, and much of this effort began after the Robert Hanssen espionage case—in which an FBI agent was convicted of selling secrets to the Soviet Union. The bureau continues to improve its monitoring capabilities, and it is looking to extend these into the mobile environment.

For the DIA, the top priorities range from day-to-day information management to the ICITE. The agency also runs the Joint Worldwide Intelligence Communications System (JWICS)

with a focus on telecommunications connectivity and voice and video services, for which it is increasing security. Schneider allows that the agency believes that the integration of the intelligence community elements makes infinite sense. "It enhances our ability to do information sharing ... it ensures that, if you are part of the intelligence community, then you really are on the same team—we're moving toward the same objectives," he states.

Schneider adds that, as the desktop technology integration moves forward, the DIA may end up with more defense intelligence customers than intelligence community customers. Its drive toward common tools and enhanced collaboration will attract more customers among the large volume of defense personnel, both policy makers and warfighters.

"For [the] DIA to be successful, we have to be able to get information from across the entire community," Schneider says. The DIA has a broader reach and a more diverse customer set within the defense community than do many of the other intelligence community elements. Those other agencies own most of the intelligence that they need, while the DIA is the steward of only a small percentage of the intelligence information it needs, he elaborates, adding, "We have to have the information-sharing capabilities across the community in a way that is a little different than most others."

The NRO CIO's top priorities are to exploit the ICITE effectively, Singer says. While the office is not generating new technologies for the ICITE effort, it is positioning itself to be prepared to provide all necessary input to its ICITE colleagues in the effort. The NRO also is working with the other agencies on security initiatives, particularly in terms of identity and access management capabilities.

She continues that the NRO has neither an enterprise data architecture nor an enterprise data strategy. So, it is trying to assemble the necessary resources to build that as it moves into the ICITE. The office also is striving to improve its data tagging, which she says must be done in a smarter way.

Jill Singer is the chief information officer for the National Reconnaissance Office.

"It will be quite an undertaking for us, in the long term, to get our arms around all of the data that we have and make sure that we have a smart data strategy going forward," Singer states.

Schneider warns of potential bumps in the road to intelligence information sharing. Tools and technology must work together and evolve. That seems to be working, he notes. Business functions may be the biggest challenge, as issues such as whether or not to adopt a fee-for-service model—and how it would work—remain to be resolved.

Hall believes that technology issues will be overcome more easily than cultural issues. Resolving these will require policy agreements across the board, and these will be complicated by statutes and limitations.

Schneider offers that the community needs technologies that are open and interoperable. In particular, members of the vendor community must come to the table expecting to collaborate with their peers. Different parts of the environment must work together, and the intelligence community must have its vendors working together both in teams and as separate elements.

He continues that customers are seeking five aspects of technology solutions: agile tools and capabilities; simple solutions that are relatively intuitive to operate; tools that are integrated horizontally to enable data interoperability; affordability; and security. The community must find ways to integrate new consumer technologies into the business process as well as into the technology, he emphasizes.

Singer allows that the NRO will continue to need good collaborative tools or capabilities that resemble commercial social networking so that the office can apply diverse expertise to a vital topic—regardless of where that expertise is located. She adds that a major challenge for the NRO is to have an internal enterprise infrastructure provider in which applications are separated from infrastructure. Most NRO infrastructure elements are complex and often built as an entire stovepipe. Accordingly, an organization or a contractor would deliver hardware and software to the office. The NRO could obtain government-furnished equipment for the infrastructure, and then applications providers would build on top of that.

She continues that the blurring of the lines between strategic and tactical intelligence continues to challenge the NRO. The office will need to make "strategic assessments of global events" quickly—in a matter of weeks. This is driving a faster and more integrated form of information sharing, she posits.

The FBI's biggest information technology challenge involves its legacy equipment, Hall shares. Moving information from that "big-iron" infrastructure to a Web-based environment is a vital step. The bureau needs cross-domain solutions so that it can move data from Secret holdings to the unclassified environment, where it can be shared with elements of the legal system.

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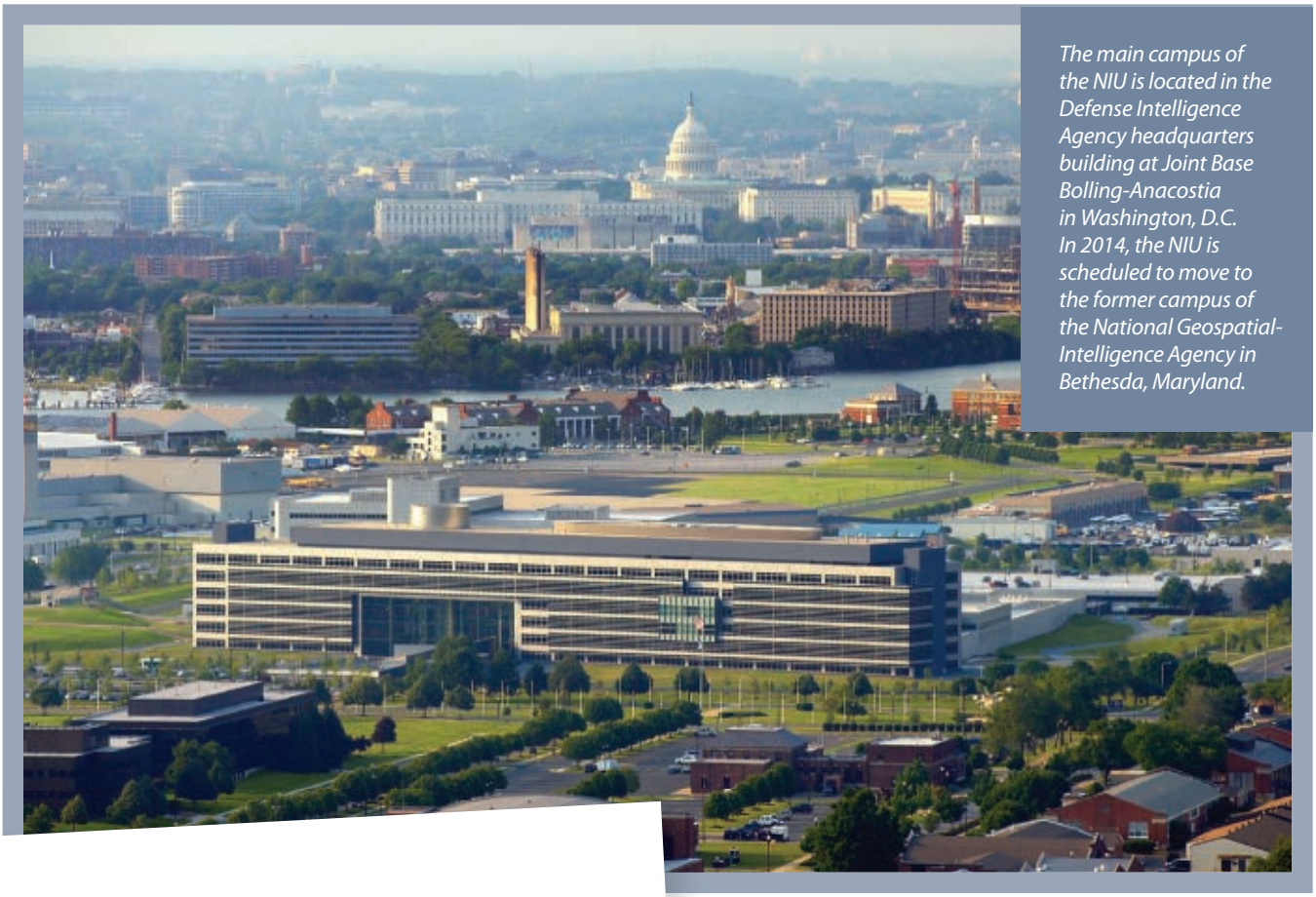
WEB RESOURCES

DIA IT Strategic Vision:
www.dia.mil/about/strategic-plan/it.html

FBI Information Technology Branch:
www.fbi.gov/about-us/itb

National Reconnaissance Office:
www.nro.gov



Defense Intelligence Agency

The main campus of the NIU is located in the Defense Intelligence Agency headquarters building at Joint Base Bolling-Anacostia in Washington, D.C. In 2014, the NIU is scheduled to move to the former campus of the National Geospatial-Intelligence Agency in Bethesda, Maryland.

Writing a New Spy School Syllabus

The National Intelligence University prepares for its fifth decade with a shift in focus and a change in venue.

BY MAX CACAS

The National Intelligence University, which provides advanced training to U.S. intelligence professionals, is transitioning from an institution primarily focused on the U.S. Defense Department to one serving the entire intelligence community. This reflects the new emphasis toward sharing and collaboration within the nation's intelligence apparatus.

To make the change a reality, National Intelligence University (NIU) leaders are rethinking and expanding the educational programs the institution offers. Plans also are underway to relocate the university to its own new campus in the very near future—in part to bolster its perception as an intelligence community strategic resource.

Dr. David R. Ellison, president of the NIU, says that the change began with the appointment of James Clapper as the director of National Intelligence in 2010. "Director Clapper recognized that if we were going to have a National Intelligence University in the intelligence community, the best place to start was with an accredited institution

that had already achieved success in an academic area," Ellison explains. He adds that Clapper went on to draft a memorandum to then-Secretary of Defense Robert Gates, defining education as a force multiplier and a tool that must be used to the advantage of the entire intelligence community.

"What he envisioned was that the then-National Intelligence College would become the National Intelligence University, and it would provide accredited education, academic research and academic outreach to the intelligence community as a whole," Ellison points out.

National Intelligence University at a Glance

Founded: 1962

Accreditation:
Middle States Association of Colleges and Schools

Degrees:
- Bachelor of Science in Intelligence
- Master of Science in Strategic Intelligence
- Certificate of Intelligence Studies

Campuses:
- Defense Intelligence Agency (DIA) Headquarters, Joint Base Anacostia-Bolling, Washington, D.C.
- National Security Agency (NSA), Center for Advanced Study of Language, Fort Meade, Maryland
- National Geospatial-Intelligence Agency (NGA), Fort Belvoir, Virginia

Student Profile (2011):
- Total: 624
- Resident Students: 212
- Evening Students: 72
- Weekend Students: 108
- Space Available/ DIA Cohort : 71
- NGA: 27
- NSA: 19

Full-Time Faculty: 41 • **Part-Time Faculty:** 41

Intelligence Community Organizations Represented:
DIA, CIA, FBI, State Department, NGA, NSA, Office of Management and Budget, Commerce Department, Drug Enforcement Administration, U.S. Army, Air Force, Navy, Marine Corps, Coast Guard, Transportation Department, Justice Department, U.S. congressional staff, Bureau of Alcohol, Tobacco, Firearms and Explosives, Department of Homeland Security, Energy Department, Naval Criminal Investigative Service, U.S. Army Intelligence and Security Command, Office of Naval Intelligence, Office of the Director of Naval Intelligence, National Counterterrorism Center.

The change meant that the NIU would transition from being an arm of the Defense Department to become part of the Office of the Director of National Intelligence. It would serve all of the constituent agencies of the intelligence community, which includes the Defense Department.

"We now take a whole-of-government approach to the way we do business in both the civilian intelligence community and in the defense community," Ellison outlines. "We're trying to bring the military together, the Drug Enforcement Administration [DEA], the State Department, FBI and CIA, because they all have to work together in the real world."

He also says that a big part of the way the NIU operates involves "creating the diversity not only in the faculty that's doing the teaching, but also in the student body since the richness of the education can come from the diversity of the students." Part of the effort to divest the NIU from its mostly military roots and become an intelligence community resource will involve a change in venue. The NIU currently is housed within the headquarters building of the Defense Intelligence Agency, situated at Joint Base Anacostia-Bolling in Washington, D.C. In 2014, the NIU is slated to move to its own new headquarters and main campus on the former grounds of the National Geospatial-Intelligence Agency (NGA) in Bethesda, Maryland. The NGA relocated last year to Fort Belvoir, Virginia, as part of the base realignment and closure process.

The move is one with important symbolism. "We still have a perception in the intelligence community as a defense entity. We're not a defense entity; we're an intelligence entity," Ellison declares.

Ellison says that along with helping to set a new identity for the NIU, the move also will make it possible to expand future enrollment. In defining mission success for the NIU, he says, "Your program has to be relevant; it has to be accessible; and it has to exist over the life of an intelligence professional's career."

He believes the kind of education that the NIU provides to the intelligence community is crucial. "It's important that our intelligence professionals be adaptive, that they be agile, and that they be innovative, and even be able to think out ahead of adversaries," Ellison explains.

The NIU's strategic plan defines the academic program for the education of intelligence analysts. "We require critical thinking, along with a depth of knowledge about the intelligence community," Ellison says. As part of their education, "We challenge them to use their skills in taking on a research project, and all individuals must complete a research thesis over the 10 months that they are here."

At a time when cybersecurity and information technology are very important parts of the work of the intelligence community, Ellison reports that the NIU's Anthony G. Oettinger School of Science and Technology Intelligence is offering programs to help analysts deal with the ever-changing information technology landscape. "We have concentrations in emerging and disruptive technologies, weapons of mass destruction, denial and deception, geostrategic resources, along with cybersecurity." He also says that the NIU is developing its own cyber laboratory as part of the effort to keep the school's science and technology offerings on the cutting edge.

"Director Clapper recognized that if we were going to have a National Intelligence University in the intelligence community, the best place to start was with an accredited institution that had already achieved success in an academic area."

—Dr. David R. Ellison, president, National Intelligence University

Another way that the university serves the entire intelligence community is to provide a means to promote and foster interagency cooperation and collaboration. "When I sit down and I talk to our students, I find that almost 100 percent of the time, they say that the most valuable thing they got out of the school was the fact that they were studying intelligence problems sitting beside an Air Force person, an Army person, a Coast Guard person, FBI, DEA, State," Ellison explains. Personal relationships sometimes can mean success or failure when officials from different agencies must work together to solve a common intelligence problem.

In adjusting to serve the civilian agencies that are part of the intelligence community, Ellison points out an important distinction between Defense Department and civilian intelligence groups is their ability to send staff to participate in the NIU's education programs. While military intelligence organizations readily can replace personnel sent to the university for additional training, the same is not always the case for civilian agencies. "If the FBI, for example, sends someone over here, that person is lost for a year," he emphasizes. And, managers are sometimes reluctant to release key operational personnel for an extended period of time.

Ellison says it depends on how much the institution values education. "There are those who say it's much more important that I take one year and develop that intelligence professional to be a long-term asset for me, even though I have to figure out how to compensate." At the same time, he says, the NIU is borrowing a page from more traditional universities and colleges to make it possible for busy intelligence professionals to receive the training they need.

"We have to extend and be much more accessible so that people can do this as easily as possible. We have full-time programs; we have Reserve programs; we have weekend executive programs; we have part-time programs and so forth," he adds.

Agencies are more willing to give their employees time to pursue NIU degrees with part-time programs, even though it takes several years to complete their degrees, Ellison emphasizes. Also, like other educational institutions, the university offers part-time degree programs at places such as the University of Maryland in College Park, and at Fort Belvoir, Virginia. The NIU has worked with the military's U.S. Pacific Command (PACOM) to establish a four-month intelligence certificate program focusing on China that is taught by NIU instructors at PACOM headquarters in Hawaii.

The NIU president, a retired U.S. Navy rear admiral, says a key to the university's success is that like other institutions of higher education, its programs are subjected to rigorous academic review on a regular basis by outside auditors from the Middle States Commission on Higher Education. These reviews ensure that the school's programs fulfill the goals that they set. The NIU has been a member of this consortium since 1983 and last was reviewed in 2008.

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WEB RESOURCES

National Intelligence University: ***www.ni-u.edu***

Office of the Director of National Intelligence/ U.S. Intelligence Community: ***www.intelligence.gov***

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Predator unmanned aerial vehicles (UAVs) are controlled using satellite-based Global Positioning System (GPS) tracking systems. If the GPS link is jammed, then the UAV may be rendered ineffective.

Global Positioning System Is a Single Point of Failure

GPS vulnerabilities could be addressed with upgraded long-range navigation.

By Capt. Charles A. Barton III, USAF

In an instant, one million people in Tel Aviv are vaporized. Hamas, the terrorist extremist group backed by Iran, has detonated a dirty bomb—a conventional explosive with radioactive material—and is attacking Israel with long-range rockets. Concurrently, the U.S. Air Force loses all communication with its Navigation System Timing and Ranging Global Positioning System satellites. Intelligence reports indicate that Iran has launched multiple antisatellite missiles that have destroyed several navigation satellites, effectively disabling the Global Positioning System.

This is a fictional scenario, but it may not be that far-fetched. The U.S. military must take into account the vulnerabilities of its Navigation System Timing and Ranging (NAVSTAR) Global Positioning System (GPS) and invest in a land-based system that provides the same capabilities.

In a 1980 report to Congress, the General Accounting Office (GAO) stated that the NAVSTAR system "was not started to satisfy unmet military needs or operational deficiencies but rather to generally improve navigation capabilities." Nevertheless, the military soon realized the enhanced capabilities that the GPS could provide, and it "defined specific mission requirements" for the system. The plan was to launch 24 satellites, allowing for four satellites to be in "view from any spot on Earth at any time." The system was scheduled to be 100 percent capable by September 1987 with an original

GPS satellites are vulnerable to jamming in the same manner as radio signals. However, GPS signals are much easier to jam because of their low signal strength and because their transmission frequencies are common knowledge.

cost estimate of $1.7 billion. In 1980, the GAO revised the cost estimate, stating that it would cost $8.6 billion to cover the program through 2000. In reality, the system did not become fully operational until April 1995, with an estimated cost of between $10 billion and $12 billion. Additionally, Air Force officials stated that it would cost approximately $400 million annually to provide the GPS. Ultimately, the cost of the GPS was six to seven times more expensive than originally planned, and it was deployed with known vulnerabilities.

The system is open to attack from several different means, including antisatellite (ASAT) missiles, electronic warfare through jamming and network attack. In the 1980s, the United States and the Soviet Union both were testing ASAT weapons to bolster their military posture during the Cold War. The United States stopped testing in 1985 due to its concern that space junk could damage other satellites. Furthermore, 99 nations signed on to the 1967 Outer Space Treaty that was designed to prevent "the stationing of weapons of mass destruction in outer space." Many countries argued that the treaty did not go far enough because it did not specifically ban other types of conventional weapons.

Nevertheless, the treaty seemed to have an effect because no weapons openly were fired into space for 22 years. On January 11, 2007, China shocked the world by shooting down one of its own weather satellites using a ground-based medium-range ballistic missile. The event was condemned by several countries—including the United States, Japan and Australia—over fears that it would start a new space arms race. The United States could not allow this show of force to go unanswered. On February 21, 2008, the United States fired a Standard Missile-3 from the ship USS *Lake Erie* in an "effort to shoot down an inoperable spy satellite before it could crash to earth and potentially release a cloud of toxic gas," CNN reported.

Coincidentally, the United Nations Conference on Disarmament was in the middle of its first session for 2008. Seven days after the spy satellite was shot down, China and Russia submitted a joint treaty on the "prevention of the placement of weapons in outer space" and the "threat or use of force against outer space objects." The United States argued against the need for additional treaties on the grounds that there was not an ongoing arms race in space.

Ironically, the tests by China and the United States did compel other countries such as Russia and India to start developing similar ASAT weapons. In March 2009, one of Russia's deputy defense ministers stated that Russia would begin developing its own ASAT weapons in addition to bolstering its nuclear and intercontinental ballistic missile systems. India followed suit in May 2010 by stating it would develop ASAT weapons capable of attacking satellites in both low earth orbit and geosynchronous orbit. These statements make it abundantly clear that U.S. GPS satellites no longer could rely on altitude for safety.

Additional concerns are that GPS capabilities could be rendered useless with certain types of electronic warfare jamming equipment and network attack. An example of GPS jamming occurred in 2009 when engineers at Newark Liberty International Airport, Newark, New Jersey, noticed their equipment would lose signal during certain times of the day. The Federal Aviation Administration (FAA) investigated the problem and found that a local truck driver had installed an inexpensive jammer in his vehicle. On his way to work every day, he passed the airport and caused its systems to fail. The driver was using the jammer to prevent his employer from tracking his movements. The scary fact is that anyone can purchase this equipment for as little as $30 on the Internet. Even though these jammers are illegal to sell, purchase or use, people still buy them.

Another instance occurred in January 2007 during a U.S. Navy training exercise in San Diego. The Navy was evaluating its ability to operate ships in a situation with total loss of communications. To test this, it used jamming equipment to block all radio signals. The Navy unintentionally blocked all GPS signals in the San Diego area, causing FAA systems, cellphones, pagers and automated teller machines to fail.

This type of jamming easily could be used by a foreign military or terrorist organization to cause chaos.

A recent example of this happened in late 2011 when Iran's military claimed it brought down a U.S. unmanned drone using GPS jamming in conjunction with a computer attack. It jammed the drone's GPS signal to force it into autopilot mode. Then, the Iranian military used a computer attack to spoof the GPS signal, making it appear to the drone's computer that it was headed to a U.S. base when it actually was being routed to an Iranian location. Some researchers have acknowledged the plausibility of the Iranians' story. The reality that the drone looks undamaged lends credibility to their claims. The fact that experts believe the Iranians' story to be possible provides evidence that the military's GPS is susceptible to attack.

A portable Global Positioning System jammer for a car can be purchased online for less than $50. A military jammer will be much more powerful with increased range and accuracy.

This is another example proving that the GPS system is vulnerable. The U.S. military must take a hard look at all solutions that would provide a redundant capability. One such possibility is a system known as long-range navigation (LORAN). This system was developed in 1958 to provide navigation for shipping. It uses powerful signal pulses at a low frequency and is not line-of-sight dependent. Consequently, LORAN does not have the same vulnerabilities as the GPS. However, on February 8, 2010, the U.S. Coast Guard stopped the LORAN transmissions, effectively retiring the system. Even though LORAN was retired, researchers at Stanford University and the U.S. Coast Guard continue to develop a 21st-century model.

The project is known as eLORAN. It provides the added capability of a data channel plus vastly improved accuracy. For example, LORAN was accurate to approximately 460 meters, while eLORAN is accurate to between 8 and 20 meters. This is comparable to most handheld GPS receivers, which are accurate from 10 to 20 meters. The U.S. military has receivers that are accurate to less than one meter. eLORAN's accuracy will need to be

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developed further to provide the same military GPS capability.

The United States needs to invest additional funding into this system to develop its viability as a backup to the GPS. However, the greatest argument against any new system is its cost. Currently, the U.S. military is looking at a budget reduction of $500 billion. Some critics suggest this may have the unintended consequence of reducing scientific innovation. The military spent approximately $81.4 billion on research and development during the last fiscal year. This accounted for 55 percent of the federal government's research and development funding. History shows that military research and development is cut at the same percentage as budget reductions. Fiscal hawks will argue that the military does not require a redundant capability for the GPS. On the other hand, the U.S. National Security Strategy report states that the U.S. military must preserve its "conventional superiority."

Scientific innovation is exactly what is required to develop a redundant capability for the GPS. It is blatantly obvious that the GPS is highly vulnerable, and the United States must prioritize funding for research and development of a comparable system. eLORAN is one possible solution to this problem. The Defense Advanced Research Projects Agency (DARPA) has a history of "50 years of innovation and discovery." DARPA should be assigned as the lead for this project, and it should fund a competition so that multiple organizations will design a solution. The possibilities are endless if the Defense Department is willing to make it a priority.

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Capt. Charles A. Barton III, USAF, is the chief of plans and programs at the 689th Combat Communications Wing, Robins Air Force Base, Georgia.

WEB RESOURCES

U.S. government GPS information
www.gps.gov

U.S. Coast Guard strategic plan
www.ucgs.mil/hq/cg6/docs/C4IT-Strategic-Plan.pdf

China Ship Upgrades Enable Underwater Surveillance

Towed array technologies add new capabilities to destroyers.

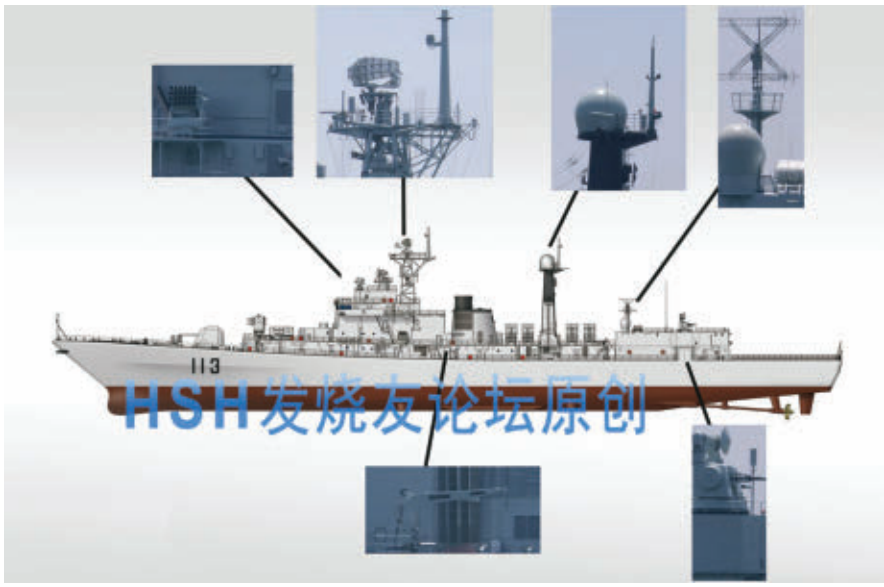
BY JAMES C. BUSSERT

Recent improvements in Chinese destroyer technology have opened the door for greatly expanded surveillance and reconnaissance capabilities, particularly for undersea operations. Advances range from new power plants and weapons to radars and sonars that provide versatility known to other modern navies.

Many of these upgrades involve long-overdue improvements in warship operations. Electronics and missile advances acting synergistically are enabling new shipboard defense systems. But new sensor suites, particularly in sonars, are changing the nature of Chinese naval missions.

With China's People's Liberation Army Navy (PLAN) building ship classes in small numbers, upgrades must be tailored to different vessels. The first new warship design to follow the prototype advanced sensor and weapon installations on upgraded *Luda* destroyers involved the two 052 *Luhu*-class vessels—the DD-112 *Harbin* and DD-113 *Qingdao*. The DDG-112 was the only destroyer built by Quixin shipyard because the facility became part of Jiangnan shipyard after 1994. The DDG-113 was launched in 1996 at Jiangnan. These were followed by four additional new warship class designs that were launched in a fairly brief 12-year span.

These series of incrementally more sophisticated designs were limited to production runs of one or two ships each. Raising the warship capabilities in that short period of years was a costly and formidable task. The upside for China is that it did advance from old *Luda* destroyer modifications up to an Aegis-type phased array/vertical launch warship in only nine years, which is an amazing feat. The downside is that China has the logistic, maintenance and training headache of trying to support five unique warship classes totaling only nine vessels. The most outdated ships were the two initial *Luhu*s, which even featured different propulsion plants in each ship. A U.S. LM-2500 gas turbine was on the DDG-112, and a Ukrainian GT-25000 was on the DDG-113. During refit in 2003 and 2005, both ships replaced their PJ-33A 100-millimeter guns with new stealthy 100-millimeter guns, and YJ-81 ship-to-surface missiles were replaced with new YJ-83 missiles. The subsequent generations of 051- and 052-series ships advanced beyond the *Luhu's* sensor and weapon technology, particularly on the DDG-112.



HOBBY SHANGHAI (HSH)

This schematic of the Luhu*-class ship shows the areas that recently were upgraded.*

In 2009, both *Luhu*s started very long overhauls to upgrade many of their combat systems. The DDG-112 remained in overhaul into 2012 and was so completely gutted—including removal of the engineering plant and funnel—that it probably appeared it was being scrapped. The obvious topside DG-112 systems were removed, and one can imagine the unseen modifications below decks advancing from analog to digital automated equipment. Almost certainly, the 1980s-vintage French Thomson CSF TAVITAC was replaced by one of the newer combat direction systems such as the ZJK-4B or later models.

The Type 518 long-range airport surveillance radar, unique to the *Luhu*s, was replaced by an old metric Type 517 radar that dates directly to the World War II Soviet Knife Rest land-based radar. The installation of these

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RDML Jerry K. Burroughs, USN (accepted) Program Executive Officer for Command, Control, Communications, Computers and Intelligence

Vinton G. Cerf (accepted) Vice President & Chief Internet Evangelist, Google

Mr. Terry Halvorsen, SES (accepted) Chief Information Officer, Department of the Navy

RDML Gretchen Herbert, USN (invited) Commander, Navy Cyber Forces

Dr. Bobby Junker, Ph.D., SES (accepted) Department Head , C4ISR Department, Office of Naval Research

RADM William E. Leigher, USN (accepted) Director of Warfare Integration for Information Dominance (OPNAV N2/N6F)

Mr. Christopher A. Miller, SES (accepted) Executive Director, SPAWAR Systems Center Atlantic

MG Bert K. Mizusawa, USA (invited) Assistant to the Chairman, JCS, for Reserve Matters

BGen Kevin J. Nally, USMC (accepted) Director C4/CIO, Deputy, MARFORCYBER, US Marine Corps

Dress: Business Casual/Uniform of the Day

RDML James H. Rodman Jr., USN (accepted) Chief Engineer, Space and Naval Warfare Systems Command

RADM David G. Simpson, USN (accepted) Vice Director, Defense Information Systems Agency (DISA)

Mr. Robert A. Stephenson, SES (invited) Executive for Fleet Systems Engineering, Space and Naval Warfare Systems Command

Joint Panel 1 – PEO's - "Providing the Resources for A2AD Success" PMW 120 CAPT Scott Heller, USN; PMW 130 CAPT Kevin McNally, USN; PMW 150 CAPT Don Harder, USN; PMW 160 CAPT D. J. LeGoff, USN; PMW 170 Vince Squitieri

Joint Panel 2 – "Challenges and Lessons Learned Operating in an A2/AD Environment"

Joint Panel 3 – "The Clouds of War; There are No Clouds in Sight"

Technical Track I - "Preparing to Fight an A2/AD War with One Hand Tied Behind your Back"

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dated radars has increased since Serbia downed a U.S. F-117 stealth fighter in 1999 with a Soviet SA-3 and long-wavelength radar. A modern SR-64 multifunction missile defense targeting radome was installed on the aft mast. Two Type 726-4 multipurpose decoy launchers were installed adjacent to the bridge, where two twin 37-millimeter gun mounts were sited. The original four twin 37-millimeter Type 76A guns and associated 347G Rice Lamp radar located forward and aft were replaced by two Type 730 close-in weapon systems for defense aft on top of the helicopter hangar. The Type 730 has a TR47C FC radar and OFC-3 electro-optic director. The close-in weapon system fires 4,600 to 5,800 rounds per minute with an effective range of 1,500 meters and a maximum range of 3,000 meters. Removing two twin 37-millimeter mounts forward and not replacing them with a close-in weapon system, as was done aft, appears to decrease forward anti-air warfare (AAW) defense. A British ISPN-1 satellite communications (SATCOM) system was replaced by two new SATCOM Big Ball super-high frequency radomes and a smaller Ku-band SATCOM system above the helicopter hangar.

Both original *Luhu*s were intended to have GE LM-2500 gas turbine propulsion. One was installed on the DDG-112, but after the Tiananmen Square massacre, the DDG-113 had to substitute a Ukraine GT-25000 gas turbine. Because the LM-2500 on the DDG-112 has no logistic support, it had to be replaced with a Ukraine GA-30 gas turbine.

Unlike the other 051- and 052-class vessels that had AAW and antisurface warfare (ASUW) missions, the two *Luhu*s were unique with antisubmarine warfare (ASW) mission sensors and weapons. The 12-tube type FQF-2500 ASW launchers were replaced by longer-range 5,000-meter, 6-tube Type 87 ASW launchers. The most important change was the removal of the aft variable depth sonar (VDS) and installation of a towed linear array, termed towed array sonar system (TASS). Most naval references state that *Luhu*s had the French DUBV-43 VDS, but photos of the *Luhu* VDS fish show that it actually

is an Italian 7.5-kilohertz DE-1164 with four stabilizing fins aft, instead of three fins mounted 120 degrees apart as on the DUBV-43.

The VDS replacement is not mentioned in descriptions of the overhaul, possibly because it largely is below decks and out of sight. A study of the pre-overhaul stern with the VDS and post-overhaul enclosed stern shows that an internal change did take place. This has been a major Chinese ASW gap among PLAN surface warships, which have focused on ASUW and AAW but not on ASW. Some references credit newer 054A and also four *Jiangwei I* frigates with towed array sonar, but it has been very low profile and largely unnoticed.

Most Russian and U.S. towed arrays have a smooth round opening on the centerline of the ship or submarine, as on U.S. Navy Aegis cruisers with the SQR-19 aft. The modernized *Luhu* sterns have round line-handling ports on each side below their square torpedo decoy and TASS ports to port and starboard respectively, as on prior frigates. In December 2010, a 10-foot by 5-foot opening was cut in the stern, where it would have been necessary to install the huge towed array handling winch in place of the VDS that was shown removed in photos. Images also appeared of the towed array cable on a reel going into the helicopter hangar to be used on the TASS. A photo of an 054A frigate with a thin cable being trailed from a small opening on the port side of the stern likely shows the SQK-6 anti-torpedo decoy. There are several nominees for the type of passive towed array being installed on the *Luhu*s.

The 2004 CIDEX trade fair showed a TLAS-1 Chinese towed array being marketed for foreign sales. It was developed by the Hanzhou Applied Acoustics Research Institute and was claimed to have a detection range of 25 to 45 kilometers and the ability to track up to five different contacts. The Ukraine Research and Development Institute of Sonar Technology in Kiev developed complex sonars, including towed arrays for the Soviet navy. The latest Ukraine-marketed sonar is known as Bosporus, and it includes a towed array in addition to the hull sonar.

The Russian 936 EM version *Sovremenny* sold to China included the MGK-335EM-03 hull-mounted mid-frequency sonar. This sonar has supplemental towed options that could have been procured by China. One is the MGK-335EM-02 version with a towed active and passive fish-shaped transducer, which is similar to the VDS on the two *Luhu*s. The other is an MGK-335EM-01 version with a flexible extended trailing antenna, which is similar to the new aft array on the recent DDG-112 upgrade.

Chinese literature, such as a 1997 Institute of Acoustics/Chinese Academy of Sciences paper, describes an H/SJG-208 towed line array sonar. An unidentified Chinese electronic intelligence vessel reportedly is equipped with an H/SJG-208 towed linear array sonar prior to the frigates or *Luhu*s. The PLAN *Yuan* submarine has a towed array sonar, similar to the Soviet *Victor III* pod atop the aft vertical rudder, which is part of the MGK-540 sonar suite that uses narrow- and wideband signal processing.

Since the decision to go into series production of the 052C destroyer with four new hulls launched in 2011, China might perform major upgrades to some other 052 classes similar to the *Luhu*. This would mitigate the logistics nightmare of supporting the two unique vessel classes. The *Luhai* would seem a logical candidate to be the first to be scrapped, being a unique hull. It is expected that China quietly will continue to add TASS sensors to additional ships to further enhance anti-access surveillance and tracking of Western submarines.

The standard answer to the issue of whether the PLAN has any underwater surveillance system is that no firm evidence exists. The first question to ask is what the location would be if it were to be fielded. Logically, one would be between Shanghai and Honshu to detect Japanese or U.S. submarines from Japan. Another would be between Hainan and Guam for U.S. submarines. Preceding the establishment of such a system would be considerable ocean research vessel activity, which has been observed in the 2002 to 2008 time frame. Chinese submarines have been tracked in these areas as well.

Although placement of surveillance sensors is clandestine, a necessary element would be cable-laying ships. China has had seven 1,550-ton *Youdian*-class auxiliary repair cable (ARC) vessels with two each for the North and South fleets and three in the Eastern Fleet since the 1970s. Their normal stated task is laying communication cables to island outposts. The lack of towed arrays on civilian and PLAN ships casts doubt on the necessary research in ASW underwater sound physics. However, many Chinese science papers on the field have been published, and former Soviet and Western states have exported critical sonar technology to China. The latest 092 Chinese nuclear submarine, which has much *Victor III*-claimed performance, has a towed array in the top aft rudder fin—a first for the PLAN.

Underwater harbor defense is a related technology. In 1982, three

NEXT MONTH IN *SIGNAL*

UNMANNED SYSTEMS

Wartime air forces began as reconnaissance organizations and then evolved as they began to engage in direct combat. Unmanned systems are following the same path as they are used to greater degrees with more versatility and increased capabilities. Unmanned aerial vehicles (UAVs) and unmanned underwater vehicles (UUVs) are burgeoning in the battlespace as planners discover new missions amid asymmetric combat. Innovative technologies are opening the door to even more uses as these vehicles become ubiquitous in the battlespace. In its November issue, *SIGNAL* looks at how unmanned systems are being adopted for new military roles and what the future may hold for these robotic warriors.

750-ton *Youzhong* ARC ships were launched and assigned to the Maritime Border Defense Force (MBDF). The G2693 ARC ship was attached to the South MBDF, and N2304 and N2404 were attached to the Eastern MBDF. This could point to development and deployment of harbor defense active/passive sonar sensors or littoral magnetic loops to detect intruding submarines in the mid-1980s. These would fall within the mission of border defense.

The Russian Morphyspribor Central Research Institute in St. Petersburg would be one of the more obvious sources of harbor defense active/passive sensor systems. The Russian MGK-607EM stationary sonar system for harbor defense features a combination data and power cable as long as 50 kilometers from the shore data processing and display center. The barrier length can be up to 1,000 kilometers in waters as deep as 600 meters. One reference cited an "unidentified Asian source" that "China was deploying bottom sensors in [the] SCS [South China Sea] in 2008."

Chinese sensitivity to long-range underwater surveillance has been highlighted in aggressive incidents against U.S. auxiliary general oceanographic research ships (T-AGORs) in the East and South China seas. Coincidentally, one of the worst examples of dangerous harassment occurred in March 2008 in the East China Sea, and the DDG-112 was the culprit. The *Qingdao* shined a blinding beam of light on the USNS *Victorious* for 30 minutes, injuring a U.S. sailor's eyesight.

Chinese vessels aggressively have interfered with many U.S. T-AGOR ships during towed array surveillance activity off of Chinese nuclear submarine bases in the South China and East China seas. The upgrading of *Luhus* from the VDS to TASS shows success in achieving this highly classified technology and the strategic need to counter U.S. submarines in offshore waters.

The DDG-113 left the yards around June 2011 after a year in overhaul and immediately deployed in the military diplomacy role it filled in 2012 with an around-the-world cruise visiting Canada, the United States and Australia. The ship hosted Pakistani navy warships in friendly crew exchange activities and drilled at sea when they departed for home. The DDG-113 deployed with 054A frigate *Yantai* in a Gulf of Aden anti-piracy group in February 2012.

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James C. Bussert, employed at the Naval Surface Warfare Center in Dahlgren, Virginia, is the co-author of "People's Liberation Army Navy Combat System Technology, 1949-2010." The opinions expressed in this article do not necessarily reflect the views of the U.S. Defense Department or the U.S. Navy.

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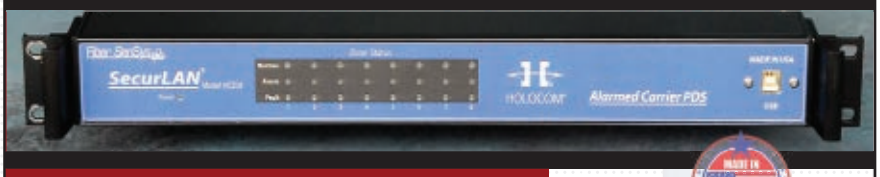

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Cybersecurity: So Much To Learn, So Much To Do

The final conference in the TechNet Land Forces series focuses on military efforts to defend vital computer networks.

BY MAX CACAS

It is noteworthy when the nation's top military leader in the realm of cybersecurity openly admits to using a piece of shareware to teach himself how to think like a hacker. Gen. Keith Alexander, USA, commander of U.S. Cyber Command, and director, National Security Agency, related in his keynote address at the TechNet Land Forces East conference at the Baltimore, Maryland, Convention Center in August, that he spends some of his nights and weekends working with Backtrack, a Linux-based software application that is readily downloadable from the Internet and allows the user to practice and learn basic cyber-penetration tactics. The general said it is vital for cyberdefenders to think like hackers, who cultivate a working understanding of the vulnerabilities of networks and who work every day to exploit those vulnerabilities.

Rear Adm. David Simpson, USN, vice director of the Defense Information Systems Agency, rhetorically asked during a panel discussion on the future of cybersecurity how one would distinguish the collection of routers and switches that make up the Internet from the kitten videos, blogs and other content that populates its servers. It is vital to understand the distinction, he emphasized. Budgets are declining, and expectations are rising that the military one day may play a role in defending not only the .gov and .mil Internet domains but also the .com private business domain. Brig. Gen. George Franz III, USA, director of current operations at U.S. Cyber Command, noted that it is vital to develop the capability to see down to the end of the conduits.

Michael Carpenter

Gen. Keith Alexander, USA, commander of U.S. Cyber Command, and director, National Security Agency, speaks at TechNet Land Forces East in August.

When organizations purchase a router or switch for a network control room, are they really getting what they pay for? A panel of experts told attendees on the second day of the conference that when it comes to cybersecurity, it pays to ask hard questions. Dan Wolf, president of Cyber Pack Ventures, said it is time that risk management in the realm of cybersecurity be integrated into federal acquisition regulations, and he urged that global standards bodies revamp their requirements to account for the need for improved cybersecurity.

An all-star panel of military cybersecurity leaders explored the question, "What Does It Take to Prevent?" The panel was led by Mary Lee, director of strategy and policy development with the National Security Agency's Cyber Task Force. Lee stressed that the inherently noncentralized nature of the global Internet dictates that teamwork and collaboration must define cybersecurity efforts. Lt. Gen. Vincent Brooks, USA, commanding general of the U.S. Army Central/3rd Army, said his biggest concern is "the weakest link: the user," and that hackers exploit the naiveté of users who allow malware to enter a network by using unauthorized thumb drives.

Rear Adm. Robert E. Day Jr., USCG, director, U.S. Coast Guard Cyber Command, explained that better training is key to defeating those bad user habits. Taking a different stance, Brig. Gen. Kevin J. Nally, USMC, chief information officer, U.S. Marine Corps, said his command is developing additional training for middle- and upper-level officers to help them become aware of the latest cybersecurity issues.

Another panel discussion emphasized the importance of U.S. coalition partners in the cybersecurity effort. Maj. Gen. John Davis, USA, senior military adviser for cyber to the Undersecretary of Defense (Policy), believes cybersecurity is a team sport and discussed how joint training exercises are being modified accordingly.

Steven Sprague, president and chief executive officer of Wave Systems, urged industry to make use of the Trusted Platform Module, a chip for which his firm writes the software. It can provide encrypted cybersecurity verification embedded in more than 600 million smartphones and computers worldwide.

Jeff Witsken, chief of network integration, Mission Command Center of Excellence, told the wrap-up panel of the conference that his organization is currently completing a military manual that, for the first time, integrates electronic warfare and cybersecurity doctrines and addresses how they are to be used in warfare.

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WEB RESOURCES

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TechNet Land Forces East conference site: ***www.afcea.org/events/tnlf/east12/intro.asp***

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Companies Can Guard Against Cyber Attacks

Threats are proliferating, but so are solutions.

BY MICHAEL A. ROBINSON

It was one of the largest and most sophisticated cyber intrusions of all time. In mid-2009, hackers found a portal hidden deep inside Internet Explorer, Microsoft's popular Web browser.

Once they burrowed in, the hackers made good use of their opening. They launched a major attack on Google Inc., focusing on email accounts as well as on intellectual property. Google caused quite the international dispute when it said it traced the attack to a province in China.

Although the Chinese denied it, a growing chorus of experts say China was almost certainly behind the attack. Not only that, the Google cyber breach was just the beginning. Before security experts shut down what became known as Operation Aurora, the highly skilled team of hackers had targeted computers in the U.S. defense network and military contractors.

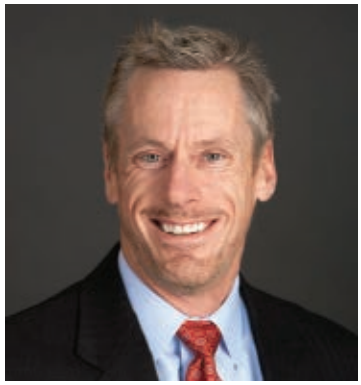
They also went after high-technology leaders in Silicon Valley as well as major financial firms. Some of the more than two dozen targets included Adobe Systems, Yahoo, Symantec, Morgan Stanley, Dow Chemical and Northrop Grumman. The widespread nature of this attack allowed the hackers to siphon off a variety of sensitive and mission-critical data, pushing their notoriety to a whole new level.

One of the nation's top cybersecurity experts says that if anything good came out the computer network crisis, it served as a wakeup call for companies all over the United States and Europe to bolster their cyber defenses.

"If you look back, this was primarily a market dominated by federal or government spending," says John Jolly, a vice president at General Dynamics. "You had people who were mostly concerned with stealing government secrets.

"But as we look forward, what we are seeing is the rapid migration of the same threat that has been for years directed at our government institutions moving into the commercial space. Individuals in the private sector are becoming increasingly more aware of the importance of good cybersecurity practices. This combined with a rapid increase in the threat environment has led to increasing demand for quality products and services."

And both the number and nature of the threats are only going to get worse, Jolly says. As general manager of General Dynamics Advanced Information Systems' Cyber Systems Division, he notes that the move to mobile devices such as smartphones and tablet computers is making corporate computer networks larger.



John Jolly
General Manager, General Dynamics Advanced Information Systems' Cyber Systems Division

Consider that some companies have bought thousands of Apple iPads to give entire staffs the ability to access mobile sales brochures, corporate videos and the like. Each of these devices is a threat in and of itself, notes Jolly. Every time a new device logs on to a company's computer network, it increases the risk that a hacker can launch code designed to break into the network to steal data or to cause damage through malware.

Meanwhile, Jolly is starting to see two other trends increase the cyber threat, cloud computing and big data. Companies as well as state and federal agencies want to move more of their data to the cloud, another name for huge server farms that people access from offsite locations.

Part of that move stems from a desire to access and analyze "big data," reams of information that can be used to increase sales or develop new products. Basically, every new computing breakthrough brings with it another round of possible cyberattacks.

"The cloud, big data, mobility—and all the other technology trends—really do increase what we refer to as the threat service for attackers," Jolly states. "They increase the complexity of the networks that we're trying to defend. Cyberattackers today are living off the complexity of our networks.

"The products and tools that we use to make our lives easier and more efficient everyday, give us great economic utility," he points out. "But they also are complex products. And it's that complexity that creates weaknesses that the attackers are able to capitalize on.

"So there's a little bit of a paradox here.

The things that are making our lives easier actually are creating more exposure to the attackers. I don't think that trend is likely to change anytime soon," he posits.

Fortunately, Jolly says, General Dynamics offers a robust suite of tools and a team of seasoned professionals who provide vigilant protection for both government and corporate computer networks against intrusions. Indeed, over the last several years, General Dynamics has invested heavily in its Advanced Information Systems unit, or GDAIS, known as one of the world's top cybersecurity operations.

The firm recently made an aggressive move to bolster its cyber division even more. In late August, the firm acquired another market leader, Fidelis Security Systems, Inc. Fidelis in turn will operate as part of GDAIS, the two firms said. Fidelis brings a wealth of experience to the table.

Founded in 2002, Fidelis has developed sophisticated tools that increase the visibility, analysis and control necessary to manage advanced threats and prevent data breaches. In particular, the firm is known for its patented Deep Session Inspection® platform, Fidelis XPS™.

Experts say it is known as the industry's only network security solution capable of seeing, studying and stopping advanced threats in real time. The system has the unique ability to work at the session level, where many of today's threats occur.

As part of GDAIS, Fidelis enables government, military and commercial enterprise customers around the globe to achieve proactive situational awareness. Clients use these tools to protect content, mitigate threats and apply activity control, all of which provide more robust cyber protection.

"We have both technology and threat intelligence that is absolutely fundamental to solving today's toughest cybersecurity problems," says Peter George, who heads the Fidelis line of business. "There's not a combination of companies in the world that bring the technology capabilities of Fidelis and the General Dynamics threat research and understanding of the adversary.

"When you put those two together, we have a really compelling offering for

Peter George

President and CEO, Fidelis Security Systems

the commercial marketplace," George continues. "Our federal business continues to grow dramatically, but the really high growth part of the market is the commercial sector, the Fortune 2000 firms that are trying to protect their intellectual property and trade secrets."

Fidelis brought some marquee corporate clients with it when the firm joined General Dynamics. For example, information technology giant IBM Corporation ranks as the largest client. But the roster also includes oil industry leader ConocoPhillips as well as the huge drug firm GlaxoSmithKline.

Both men see two key drivers adding even more pressure on commercial clients to bolster their computer defenses. One is the ability to buy cyber insurance that will help cover some of the financial losses caused by hackers. At the same time, federal authorities are pressuring firms, especially those that are publicly traded, to report network breaches in a timely manner.

Then there is the growing awareness of the new breed of hackers. These are black-hat groups that work either directly for foreign governments or under their auspices. They are skilled, highly trained and very well funded. Industry experts say as many as 50 countries may be involved in cyber attacks.

This has given rise to a new form of cyber intrusions known as advanced persistent threats. As the term implies, these are constant and very sophisticated attacks by groups who have the means and the motivation to launch attacks seemingly around the clock.

For their part, General Dynamics personnel work around the clock to protect their clients' networks at 25 field offices. In fact, the cyber division has more than 1,500 experts, making it one of the world's larger cyber defense teams.

Moreover, General Dynamics investigates the largest network intrusions impacting retail, financial and other firms worldwide. GDAIS often is called in to resolve cases that other cyber firms cannot.

Federal law enforcement agencies, regulatory units and international law firms all rely on the firm's investigative and forensic expertise. A sampling of GDAIS tools include:

- Network remediation planning to rapidly secure networks that have been breached
- Network security assessment and penetration testing to identify vulnerabilities
- Architect highly secure networks to prevent intrusions
- Design and implement network security operations centers to monitor commercial networks

With the ability to provide unparalleled cyber technologies and solutions, General Dynamics plays an integral role in helping to safeguard such government agencies as the Department of Homeland Security and the Space and Naval Warfare Systems Center Pacific Cyber Operations.

"We have deep expertise and experience with the Department of Defense," Jolly offers. "But at the same time, we are very focused on how we can add value to our commercial clients. This threat is dramatically different than it was even two or three years ago. And, that environment is only going to get worse.

"That's why we've paired our experience with forensics and working with advanced persistent threats with the world-class product that Fidelis brings. We really feel we have a winning combination here that's going to be a big help to a lot of our customers."

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Foundation Honors Friends and Graduates

The AFCEA Educational Foundation held its annual appreciation event in August to recognize and thank the corporations, individuals and AFCEA chapters that contributed to the foundation's educational programs during the year. (See a full list of donors at www.afcea.org/education/scholarships/Fund_Drive.asp.)

The event included the graduation of the 10th AFCEA Leadership Forum conducted at AFCEA headquarters. Dave Wennergren, assistant deputy chief management officer, U.S. Defense Department, addressed the 26 rising professionals in the sixth and final interactive seminar prior to the reception. AFCEA Executive Vice Presidents Lt. Gen. John A. Dubia, USA (Ret.), and Becky Nolan joined Wennergren for the graduation ceremony.

A rolling slide presentation set to music was prepared by the foundation's two volunteer summer interns—David Capen and Kelly Gawne—and featured photos from past scholarship, grant and award presentations.

Among the many distinguished guests were Tom Flannery, vice president, Tucson Chapter, attending with Larry Bingaman, Southwest RVP; Charisse Stokes, vice president for education, Montgomery Chapter, who received the foundation's Distinguished Service to Education award this year; Dr. Mark Ginsberg, dean, College of Education and Human Development, George Mason University; and Lt. Gen. Nick Kehoe, USAF (Ret.), outgoing president, Congressional Medal of Honor Foundation, who received as a memento to a set of Educational Foundation bookends from Fred Rainbow, executive director, AFCEA Educational Foundation.

Michele Salzano, principal of Samuel L. Gravely Elementary School, received a $1,000 Science, Technology, Engineering and Mathematics (STEM) Teaching Tools grant for use with STEM activities in her classrooms. This is the fourth year the grant has been awarded, in honor of the late Vice Adm. Samuel L. Gravely, USN (Ret.), former executive director of the AFCEA Educational Foundation.

Photos by Greg Mathieson (MAI Photo)

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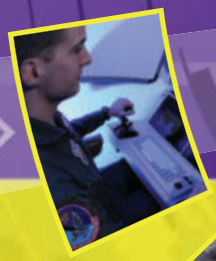

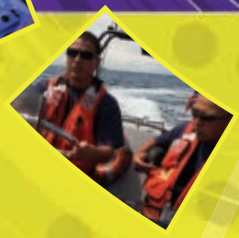

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Campaign Enhances AFCEA Access for Smart Card Users

In collaboration with the U.S. federal government, AFCEA International has launched the Federated Identity Campaign, which allows association members with Smart Cards to log into the AFCEA Secured Member Portal with one click. As a second phase of the rollout, the campaign enables the membership verification process for internal AFCEA headquarters events to allow Smart Card validation. Future plans for the campaign include expanding the ability to provide end-to-end services that involve identification authentication through federated credentials ranging from event planning to event attendance.

Government credentials that now can be used in the AFCEA portal through a common authentication interface include Common Access Cards, Personal Identification Verification (PIV), PIV-interoperable tokens, U.S. External Certificate Authority (ECA), Transportation Workers Identity Credential (TWIC) and Federation for Identity and Cross-Credentialing Systems (FiXs) certified credentials.

"This [Federated Identity Campaign] is consistent with AFCEA's dedication to increasing knowledge through the exploration of issues relevant to its members in information technology, communications and electronics for the defense, homeland security and intelligence communities," Kent R. Schneider, AFCEA president and chief executive officer, says. "Our Federated Identity Campaign will provide an example of how industry can collaborate with the federal government at an operational level, leveraging the existing identity ecosystem and enhancing the nation's overall cybersecurity posture while benefiting from an economy of scale only achievable through the adoption and exercising of a federated identity capability."

"This marks an important milestone for the adoption of federated identity authentication services," Schneider adds.

AFCEAN of the Month

Aaron T. Jones

SOUTH FLORIDA CHAPTER

AARON T. JONES is a program manager for Lockheed Martin Corporation in South Florida. Jones assisted with re-establishing the South Florida Chapter after nearly two years of dormancy, and the newly elected chapter president, Col. Randy S. Taylor, USA, chief information officer and J-6, U.S. Southern Command, commended his leadership and personal engagement during that process. As the chapter's second vice president, Jones has taken the lead on multiple fronts. He played an integral role in re-energizing the chapter while encouraging former chapter member involvement. After the chapter elected a slate of officers, Jones developed a chapter growth strategy based in part on a chapter survey. He introduced a series of initiatives, assisted with the organization of the chapter's first executive committee meeting and is leading the effort to establish a chapter Young AFCEAN program.

In addition, Jones was instrumental in the development and design of the chapter's new website, and he is assisting other chapter leaders with continued planning and execution. Three of the chapter's Model Chapter goals for 2012 already are in full swing with his help, including the Young AFCEAN program, increased individual membership and increased corporate membership. Jones is committed to helping the South Florida Chapter emerge once again as a prominent chapter.

In recognition of his support of the chapter and the association, AFCEA proudly names Aaron T. Jones AFCEAN of the Month.

New Corporate Members

Listed below are the latest organizations to become corporate members of AFCEA International. A capabilities statement for each new member will be published in this issue or in the future. A complete list of corporate members is available online at www.afcea.org/membership/corporate.

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OS NEXUS Inc.
Precision Assembly Technologies
School of Computing, University of South Alabama
Secure64 Software Corporation
Spectra Group America Inc.
Tandel Systems Inc.
Thuraya Telecommunications Company
Trinity Video Communications Inc.
Universal Data Exchange LLC (UDX)

Corporate Capability Statements

The following new AFCEA corporate members have recently completed online capability listings. See the full profiles of these and other AFCEA corporate members in searchable form at www.afcea.org/sourcebook.

ACADEMY OF COMPUTER EDUCATION

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Business Focus: TrainACE is an IT training organization that focuses on providing training solutions. Advanced Security is a division of TrainACE that is dedicated to security training classes from mid-level to advanced. Only a few companies can offer security classes at the level of some of TrainACE's courses. Its training courses are led by some of the most well-known minds in the IT security industry. The company also can prepare custom content.
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Annual Sales: $7 million.

ALG SOLUTIONS

2279 Romig Road, Akron, OH 44320
Website: www.algsolutions.com
Chief Executive Officer and President: Bruce Finn
Vice President: Kevin Dunlap
Chief Operating Officer: Del Tanner
Business Focus: ALG Solutions is a tactical support company that focuses on supporting organizations with logistics, training, staff augmentation, deployable technologies and acquisition support, and tactical services.

ECI LLC

5941 Millrace Court, Columbia, MD 21045
(410) 872-1616 • Email: sales@eci-llc.com
Website: www.eci-LLC.com
Chief Executive Officer: Edward Challita
Business Focus: Edward Challita International LLC (ECI LLC) is in the business of defending what is valuable to its customers. ECI LLC delivers innovative, cutting-edge solutions and services to customers from the public and private sectors worldwide. The company is dedicated to advancing cybersecurity through imagination, technical excellence and unparalleled passion for its work.
Products: Cybercounterintelligence, cybersecurity, cyberwarfare, information assurance, intelligence and linguistic services. Its highly qualified engineers are 8570 DOD compliant with high levels of security clearance.

Corporate Membership

for Communications, Electronics, Intelligence and Information Systems Professionals

AFCEA supports local chapters, sponsors events, publishes award-winning publications, promotes education, and provides member benefits—all with the purpose of equipping its members to meet government's challenges and to further their careers.

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Through AFCEA, your company will be associated with government decision-makers and advisors. This leads to networking, relationship building/maintenance, idea/information exchange, and ongoing discussions.

As one of our members said, "If you are not visible in AFCEA, your status as a "player" is questioned." As an AFCEA corporate member your company will benefit from visibility as a "player" in the C4, Intelligence, and IT industries doing business with the military and government. In addition, you will receive corporate visibility at the local level by participating in Chapter activities, working side-by-side with government counterparts at Chapter events, and being recognized as an active AFCEA supporter at the Chapter level.

"With AFCEA I've learned you get out of it what you put into it. Once I decided to volunteer at the local (Aberdeen) Chapter I started making much better use of my time. Now I get the satisfaction of helping a worthy organization plus a tremendous increase in exposure to business contacts that can really make a big impact on a small business like ours."
- Russell Baker, Vice President, Path Technologies, Inc.

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GROUP MOBILE

5590 West Chandler Boulevard, Suite 3,
Chandler, AZ 85226
480-705-6100 • Email: information@groupmobile.com
Website: www.groupmobile.com
Chief Executive Officer: Randall P. Marx
Marketing Director: Stephanie Kreitner
Strategic Sales Manager: Kenneth Wineberg
Business Focus: Group Mobile is a premier provider of rugged, mobile and field-use computing products. This specialization allows the company to best serve its customers due to its extensive product knowledge and singular ability to match the right products to unique requirements. It provides a Total Hardware Solution and carries rugged laptops, tablets, handhelds and UMPCs. It also carries mobile printers, vehicle computer docking and mounting gear, and all the peripherals and accessories needed to be effective in a mobile computing environment.
Products: Rugged laptops, tablets, handhelds, UMPCs, mobile printers, vehicle computer docking and mounting gear, power accessories, wireless communication products, carrying cases, antennas.

OBJECT COMPUTING INC. (OCI)

12140 Woodcrest Executive Drive, Suite 250,
St. Louis, MO 63141-5099
(314) 579-0066
Website: www.ociweb.com
Chief Executive Officer: Ebrahim Moshiri
Director of Business Development: Malcolm Spence
Business Focus: Mission-critical, real-time systems software employing standards-based open source technologies.
Products: Software engineering, design, development, test, support. Training classes on object-oriented development languages and methodology. Recruiting and staffing.
Clients: U.S. Navy, Boeing, Lockheed, Northrop Grumman, BAE Systems, GD, Avelsan, Aselsan, Australia DSTO, Alcatel Lucent, Verizon, Siemens, Bloomberg, NASDAQ, Banif.

PRECISION ASSEMBLY TECHNOLOGIES

160 Wilbur Place, Suite 400, Bohemia, NY 11716
(631) 699-9400 • Email: rmartini@pat-inc.com
Website: www.pat-inc.com
Chief Executive Officer: Russell Gulotta
Director of Business Development: Robert Martini
Business Focus: World-class electronic contract manufacturing full turnkey PCB design, assembly, test, integration, chassis and box builds, wire harness/cable assemblies, multiple automated SMT assembly lines for mixed technologies, through-hole assembly, wave soldering, BGA/LGA/uBGA 3-D X-ray inspection and fine pitch repair, environmental stress screening, counterfeit component screening.
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For further information, contact: Christina Yanette,
Publications Assistant
4400 Fair Lakes Court
Fairfax, VA 22033
(703) 631-6192
Fax: (703) 631-6188
cyanette@afcea.org

SCHOOL OF COMPUTING

150 Jaguar Drive, Suite 2101, University of South Alabama, Mobile, AL 36688
(251) 460-6390 • Email: webmaster@soc.usouthal.edu
Website: www.soc.southalabama.edu
Professor and Dean: Alec Yasinsac
Business Focus: The School of Computing at the University of South Alabama is committed to high-quality education and having a substantial impact in the computing fields of computer science, information systems and information technology. With strong programs in the growing areas of cybersecurity and health care information systems and a new 155,000-square-foot facility, the school offers an excellent scholarly environment on a modern campus, featuring Mobile's temperate climate, culture, nightlife and outdoor activities.

TRINITY VIDEO COMMUNICATIONS INC.

11400 Decimal Drive, Louisville, KY 40299
(502) 240-6100 • Email: jkolb@trinityvideo.net
Website: www.trinityvideo.net
Chief Executive Officer: Barry Sawayer
Assistant Vice President: Julie Kolb
Vice President: Matt Komos
Business Focus: Trinity Video Communications has the experience and expertise to provide real-time unified communications in any environment. Trinity has dozens of contracts with the Department of Justice, Department of Defense and other military operations. The company has top-level security clearance for many of its employees, and it knows the best ways to integrate multiple interactive video platforms on mobile devices of all types.

Young AFCEAN Advisory Council Report

The Tampa-St. Petersburg Pelican Chapter Young AFCEANs have four primary committees within their Young AFCEAN (YAC) program: Professional Development, Community Outreach, Education/Scholarships and Recruiting/Social Events. Over the past three months, the chapter's young professionals engaged in each of those core areas.

What started as a very small, word-of-mouth organization turned mainstream several months ago when the chapter's YACs came together to formally support Attire for Hire, a nonprofit organization that provides business attire and employment counseling to men and women experiencing economic hardship in the Tampa Bay area. By the end of their May community service event, the YACs had collected more than 50 dress shirts, 28 ties, 29 pairs of pants, five suits, four sport coats, seven pairs of shoes, five belts and even a tuxedo. The clothing benefited clients of both the Connections Job Development Program via their voucher program and Attire for Hire. The YACs plan to host additional clothing drives in the future.

In addition, the YACs support all operations for the chapter's Scholarship Committee. Primary duties include acting as liaisons between the chapter, the scholarship recipients and the administrators of the recipients' schools. Additional responsibilities include coordination of the disbursal of all scholarship funds, and the YACs created and implemented a tracking and archiving system to improve this process. During the May luncheon, the chapter presented $53,000 in college scholarships, and at the August TechNet Land Forces chapter luncheon, it presented $20,000 in science, technology, engineering and mathematics (STEM) scholarships. The STEM program also distributes an additional $12,000 after the student recipients have graduated and moved on to teach in the classroom.

Finally, the chapter's YACs participated in professional development events and hosted a networking reception during AFCEA's TechNet Land Forces South Conference. The event helped the Young AFCEANs recruit new members and provide information on their mission.

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* List is current as of August 7, 2012. A complete list of AFCEA's corporate members is available at www.afcea.org/membership.

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GBS TEMPEST & Service GmbH
GC&E Systems Group
GCI-General Communication Inc.
GCS Inc.
GE Intelligent Platforms
Geist
Gemini Industries Inc.
General Atomics Aeronautical Systems Inc. (GA-ASI)
General Cable Corporation
General Dynamics
General Dynamics Information Technology
General Projection Systems Inc.
Generic Systems Sweden AB
Genova Technologies Inc.
GeNUA mbH
GeoEye
George Consulting Ltd.
George Mason University
Georgia Tech Research Institute
Germane Systems LC
GET Engineering Corporation
GETAC
Getac Technology GmbH
GFN AG
Gigamon
Gigasat
GiTy Group a.s.
Glacier Technologies LLC
Glenair Inc.
Glimmerglass Networks Inc.
Globafone
Global Broadband Solutions LLC
Global Consulting International Inc.
Global Crossing
Global InfoTek Inc.
Global Knowledge
Global Market Development (dba Accusonics Products)
Global Resource Solutions
Global Satellite USA
Global Solar Energy Inc.
Global Technology Resources Inc.
Global Velocity Inc.
GlobalSCAPE
Globecomm Systems Inc.
GMPCS Personal Communications Inc.
Gnostech Inc.
Good Technology
Google Inc.
Gov Solutions Group
GovConnection Inc.
GovDirect
Government Advisors Inc.
Government Employees Benefit Association
Government Executive Media Group
Government Sales Specialists LLC
Government Technology Solutions
Govplace
GPS Networking Inc.
GPS Source Inc.
Grant Thornton LLP
Graybar Electric Company Inc.
Great Lakes Case & Cabinet Company Inc.
Greater Omaha Chamber of Commerce
Green Hat
Green Hills Software Inc.
Greystones Group
Group Mobile
Gruppo Daman s.r.l.
GS5 LLC
GSA, Federal Acquisition Service, Southeast Sunbelt Region
GTA
GTSI Corp.
Guerra Kiviat Inc.
Guidance Software Inc.
Guident Technologies
HaiVision Network Video
HAL Communications Corp.
HandySoft Global Corporation
Hanson Professional Services Inc.
Harmonia Holdings Group
Harris CapRock
Harris Corporation
Harris IT Services
Hawaii Computer Training & Solutions
Hawaii Technology Development Venture
HBC Management
HDT Global
Hegarty Research LLC
Helm Point Solutions Inc.
Hemispheres Consulting Group Inc.
Henkels & McCoy Inc.
Hermes-Medien UG
Hewlett-Packard Bulgaria
Hewlett-Packard GmbH
Hewlett-Packard s.r.o.
Hi-Q Engineering Inc.
Highlight Technologies
Hippo Solutions
Hitachi Cable America
Hitachi Data Systems GmbH
HMS TECHNOLOGIES Inc.
Holocom Inc.
HOLOEYE Systems Inc.
Homeland Security Solutions Inc.
Honeywell Technology Solutions Inc. (HTSI)
Houlihan Lokey-ADG Group
HP
HP Portugal LDA
Hughes
Hughes Network Systems
Hyper IC Florida
HYPRES Inc.
I&C International Consulting s.r.l.
IABG
IBM Bulgaria Limited
IBM Deutschland GmbH
IBM Ingenieurbuero fuer Hochbau
IBM Svenska AB
IBM U.S. Federal
ICD/RSD
ICES
ICF International
iCIO Inc.
ICZ a.s.
Idaho National Laboratory
IDC
IDG Europe AB
iDirect Government Technologies
IDTP
iGATE Technologies Inc.
IGD Security Ltd.
iGov
IHS
IHSEUSA LLC
Illumination Works LLC
iLuMinA Solutions Inc.
IMC Consulting
IMC Networks
immixGroup Inc.
Impact Cases Inc.
Imperva
iN2STEM Solutions Inc.
Indra Sistemas Portugal S.A.
IndraSoft Inc.
INDUS Corporation
INDUS Technology Inc.
Industrial Medium Software Inc.
Infinitive Federal LLC
Info Management Resources Inc. (IMRI)
Info Soft Systems Inc.
Infoblox
Infodas GmbH
InfoReliance Corporation
Informatica Corporation
Information Builders, Federal Systems Group
Information Dynamics International Inc.
Information Innovators Inc.
Information Systems Solutions Inc.
Information Technology Laboratory
Information Technology Solutions (ITS) LLC
InfoStructures Inc.
InfoTek Corporation
InfoVista
InfusionPoints
Ingersoll Consulting Information Solutions
Inmarsat Government
InnovaSystems International LLC
Innovative Defense Technologies

Innovative Information Solutions Inc.
Innovative Wireless Technology
Innovatrics
Inovamais
Institute of Air Transport
Institute of World Politics, The
Instituto de Estudos Superiores
Instituto Geografico Do Exercito
Instituto Hidrografico
Insyte LLC dba SecureNinja
INTECON LLC
Intecs S.p.A.
Integral Consulting Services Inc.
Integral Systems Inc.
Integrated Microwave Technologies LLC
Integrated Systems Improvement Services Inc.
Integrated Systems Inc.
Integration Technologies Group Inc.
Intel Corporation
INTELI
Intellicheck Mobilisa Inc.
IntelliDyne LLC
Intellifed Corporation
Intelligence & Security Academy LLC, The
Intelligence Analysis Inc.
Intelligence, Communications, and Engineering Inc.
IntelligenceCareers Inc.
IntelliGenesis LLC
Intelligent Automation Inc.
Intelligent Computer Solutions Inc.
Intelligent Decisions Inc.
Intelligent Staffing and Consulting LLC
Intelligent Waves LLC
Intelligraphics Inc.
IntelliPower Inc.
intelliSolutions Inc.
Intelsat General Corporation
IntePros Federal
Interactive Systems and Business Consulting
Interclypse Inc.
Intergraph (Deutschland) GmbH, Abt. M&I
International Power Supply Ltd.
Intervise Consultant Inc.
INTRACOM Defense Electronics
Intrepid Performance Partners LLC
Inventive Electronics Inc.
Invertix Corporation
INX Inc.
IO
IonIdea Inc.
IP Network Solutions
IPKeys Technologies LLC
IPL Information Processing Ltd.
iProtect1
Ipswitch-Network Management Division
IPTM
IRG Plotters & Printers Inc.
Iridium Communications Inc.
Iron Bow Technologies
Iron Mountain
Ishpi Information Technologies Inc. (ISHPI)
Isode Ltd.
Isodyne Inc.
Isotec Corporation
IT Cadre
IT Coalition Inc.
IT Strategic Performance Firm Inc.
iT1 Source LLC
ITIC Corporation
ITility LLC
ITMC Solutions LLC
ITT Exelis
ITT Exelis Inc.
itWatch GmbH
IW Microwave Products Division
IZ Technologies
J. Spargo & Associates Inc.
J.O.T. Enterprises LLC
JackBe
Jacobs Technology Inc.
Janus Research Group Inc.
Jayco mmi Inc.
JBM Inc.
JC Technology Federal Inc.
JDSU
Jean Simpson Personnel Services Inc.
JEM Engineering
Jenco Technologies Inc.
Jeskell
Jet Propulsion Laboratory (JPL)
JHL Communication Technology GmbH
JJR Solutions
JK Defence & Security Products GmbH
JP Morgan Chase
JT3 LLC
JTSI Inc.
Juniper Networks
Juniper Systems Inc.
Jupiter Systems
K.F. Maskell and Associates LLC
K2 (SCNA)
K2Share LLC
K3MG Technologies
KaDSci
Kaizen Approach Inc.
Kanguru Solutions
Karthik Consulting LLC
Katz Abosch Consulting LLC
KBT Business Services LLC
KDDI Corporation
Kearney & Company PC
KEIT Ltd.
KEMP Technologies Inc.
Kenjya Group Inc., The
Keya Incorporated
KeyLogic Systems Inc.
KEYW Corporation
KGS
Kimball Consulting Inc.
Kinetic Data Inc.
Kingston Technology Company Inc.
Kinney Group Inc.
Kinsey Technical Services Inc.
KippsDeSanto & Company
Kisiwa Technologies s.r.l.
KITCO Fiber Optics
KLAS Telecom Inc.
KMI Media Group
Knight Point Systems
Knight Sky LLC, Satellite Solutions and Strategies
Knowledge Advantage Inc.
Knowledge Connections Inc.
Knowledge Consulting Group Inc. (KCG)
Knowledge Continuity Consultants
Knowledge Facilitation Group LLC (KFG)
Koehlke Components Inc.
Kofax Inc.
KONIAG SERVICES Inc.
Kontron AG
Kontron America Inc.
KPMG Advisory-Consultores de Gestao S.A.
Kratos Technology & Training Solutions (KTTS)
KSJ & Associates Inc.
L-3 Communication Systems-East
L-3 Communications Corporation
L-3 Communications GCS
L-3 Communications Nova Engineering Inc.
L-3 Services Inc., STRATIS Division
L-3 STRATIS
L-3 TRL Technology
LA Consulting-Innovation Management
Lancope Inc.
Layer 7 Technologies
LCG Systems Inc.
LDSS Corporation
Leader Communications Inc.
LeapFrog Solutions
LedR
Lee Technologies Services Inc.
Leggett & Platt CVP
Lenovo
Level 3 Communications
Leviton Network Solutions
LexJet
Lexmark Government Solutions
LGS Innovations
Liberty University
Lighthouse Technologies Inc.
Lind Electronics Inc.
LinQuest Corporation
LMG International
LNO Inc.
Lockheed Martin Corporation
Lockheed Martin Information Systems and Global Solutions
Locus Microwave (Codan Satcom)
Logic Instrument Deutschland GmbH
Logic Nation Inc.
Logica Deutschland GmbH & Co. KG
Logica Sverige AB
LogicaCMG
LogicaTI Portugal S.A.
LogLogic Inc.
LongView International Technology Solutions Inc.
Lookingglass Cyber Solutions
LOQUENDO S.p.A.
Lore Systems Inc.
LPKF Laser and Electronics
LRAD Corporation
LTI DataComm
Luciad
LUCIAD Inc.
Lukos LLC
Lumeta Corporation
Lunarline Inc.
Lusis Equipamentos E Serviços LDA
Luxul Military
Lyncole XIT Grounding
LynuxWorks
M & A Technology
M & M Technical Service Inc.
M-Cubed Information Systems
M.C. Dean Inc.
M.E. Wilson Company
M2 Technology
M3COM of Virginia
MacAulay-Brown Inc.
MacDonald, Dettwiler and Associates Ltd.
MacKenzie Commercial Real Estate Services LLC
Macrolink Inc.
Main Sail
Mainframe Technologies Inc.
Management Support Technology Inc.
MANDEX Inc.
Manitou Motion Picture Company Ltd.
ManpowerGroup Public Sector
MANTECH International Corporation
Maplesoft Group
MAR Incorporated
Marinha-DAGI
Marinha-Superintendência dos Servicos de Material
MarkLogic Corporation
Marshall Communications Corporation
Martello Defence Security Consultants Inc.
Martin Yale International GmbH
Mary A. Rogers and Associates Inc.
Master Key Consulting
MAX Credit Union
MaxaVision Technologies
MaxCell
MaxVision LLC
McAfee Inc.
McAfee Portugal
McAfee, a wholly owned subsidiary of Intel Corporation
MCC Corporation
McCallie Associates Inc.
McLane Advanced Technologies LLC
McLeod Group LLC
MCR LLC
MDN/Secretaria Geral
MegaPhase LLC
MEI Technologies Inc.
Mercury Computer Systems
Meritec
Merlin International Inc.
Merrill Advisory Group
Meta-Systems Documentation Inc.
Metrica Inc.
Metropole Products Inc.
MetroStar Systems
Metters Incorporated
MI Source
MiCore Solutions Inc.
Micro-Ant LLC
MicroLink LLC
Micronetics Inc.
Microsemi Corporation
Microsoft Bulgaria Limited
Microsoft Corporation
Microsoft s.r.l.
Microsoft, s.r.o.
MicroStrategy Incorporated
MicroTech
Microwave Photonic Systems Inc.
MIL-SAT
MIL Corporation, The
MilDef AB
Millennium Corporation
Miltope Corporation
Minerva Engineering
Ministero Difesa-Direzione Generale Armamenti Terrestri
Minority Information Technology Consortium
Mission Critical Solutions-MCS of Tampa Inc.
Mission Essential Personnel
Mission1st Group
MissionMobility
MITRE Corporation, The
Mitsubishi Electric Corporation
ML Consulting Schulung Service and Support GmbH
Modis
Modus Operandi Inc.
Modus21 LLC
Moog Components Group
Moore Group, The
Morgan Borszcz Consulting LLC
MorganFranklin Corporation
MorphoTrak
Motorola Solutions
Mount Airey Group Inc.
Moxie Informatics
MRI Technologies
MRV Communications Inc.
MSFT-Software Para Microcomputadores LDA
MTN Government Services
Multiconsult s.r.l.
MultiLingual Solutions Inc.
Mutual Telecom Services Inc. (subsidiary of Black Box Corp.)
MWCO
NACON Consulting LLC
Nacre US Inc.
Nakuuruq Solutions LLC
Namtek Corp.
NanoShare s.r.l.
Napersoft
NASA SEWP
Nasittuq Corporation
National Air Cargo (Deutschland) GmbH
National Conference Center, The
National Conference Services Inc.
National Instruments Italy s.r.l.
National Security Partners
NATO CIS Services Agency-Naples
NC4
NCI Information Systems Inc.
NCS Technologies Inc.
ND SatCom GmbH
ND SatCom Inc.
NES Associates
Net Optics Inc.
NetApp US Public Sector
NetCentrics Corporation
NetIQ
NetLink Resource Group Inc.
NetScout Systems
NetSecurity Corporation
NETWAR DEFENSE CORPORATION
Network Critical
Network Equipment Technologies
Network Harbor Inc.
Network Innovations
Network Instruments
Network Integrity Systems Inc.
Network Security Systems Inc. (NSSPlus)
Neuro Logic Systems Inc.
NeuStar Inc.
Neuxpower Solutions Ltd.
Nevion
New Horizons of Southern Arizona
New Horizons Telecom Inc. (NHTI)
New Tech Solutions Inc.
New World Case Inc.
New World Solutions Inc.
Newberry Group
NEWSAT Limited
Newtec America Inc.
Next Century Corporation
Next Tier Concepts Inc.
Nextek Incorporated
NexTek Inc.
Nexum Inc.
NIC4 Inc.
NIITEK
NIS Solutions
Nisga'a Data Systems LLC
NITAAC
NJVC LLC
Nokia Siemens Networks
Noren Products Inc.
Northern Red
Northrop Grumman Corporation
Nova Corporation
Nova Datacom LLC
NOVA Electric Inc., A Division of Technology Dynamics
Nova Power Solutions Inc.
Nova Southeastern University, Graduate School of Computer and Information Sciences (GSCIS)
Novabase Consulting SA
Novel Applications
Novetta Solutions
Novonics Corporation
NOVUStar LLC
NOWATRON Elektronik Spol. s.r.o.
nPulse Technologies LLC
NSR Solutions Inc.
Ntegra IT Solutions Inc.
NTG
NTT Data Corporation
NTT Data Federal Services Inc.
Nutanix
NuWave Solutions
NuWaves Engineering
NW Systems Inc.
OakTree Enterprise Solutions Inc.
Oasis Systems LLC
Oberon Inc.
Object Computing Inc. (OCI)
Objective Interface Systems Inc.
Occam Solutions
Ocean Riders Engineering Inc.
Oceus Networks
Octagon Systems
Octo Consulting Group
Odin, Feldman & Pittleman
Offspring Solutions LLC
OHB System AG
Oklahoma State University-University Multispectral Labs (UML)
Oldcastle Precast Inc.
Omnitron Systems Technology Inc.
On Call Communications
Onix Networking Corporation
OnPoint
Opasnet
OpenText
Operational Research Consultants Inc.
OPSWAT Inc.
Optical Cable Corporation
Optimal Enterprise Solutions Inc.
Optimal Satcom Inc.
Optivor
Oracle America Inc.
Oracle Canada ULC
Oracle Deutschland B.V. & Co. KG
Oracle Government, Education & Healthcare
Oracle Portugal
ORBCOMM LLC
Orbit Communication Systems
Ordine degli Ingegneri della ProvInc. ia di Roma
Orion Systems Inc.
OS NEXUS Inc.
Overlook Systems Technologies Inc.
Overwatch Systems Tactical Operations
Owl Computing Technologies Inc.
Pacific Center for Advanced Technology Training
Pacific Star Communications
Pacific Wireless Communications LLC
Packaging Strategies Inc.
Packet Forensics LLC
Padova Technologies Inc.
Palo Alto Networks
Palomar Products Inc.
Panasonic Marketing Europe GmbH
Panasonic Solutions Company
Panduit Corporation
Pangia Technologies LLC
Parabon Computation
ParAccel Inc.
Paradigm Services Limited
Paragon Communications Solutions Inc.
Parsons
Parvus Corporation
Path Technologies Inc.
Patriot Technologies
PCI Strategic Management LLC
PCTEL Inc.
PD Inc. International
PDQ Precision Inc.
Pechanga Technology Solutions Group
Peerless Technologies Corporation
Pelatron Inc.
Pelican Products Inc.
Peregrine Technical Solutions LLC
PERGRAVIS LLC
Perkins Technical Services Inc.
Pervasive Software
PESA
PESystems Inc.
PGTEK Inc.
Pharad LLC
Pherson Associates LLC
Phirelight Security Solutions Inc.
Phoenix Data Corporation
Phoenix International
Phoenix Technology Solutions
PICMG
Pinhol SA
PioneerTech
Pixia Corp
PKWARE Inc.
Plan B Government Systems Inc.
Planar Systems Inc.
Planet Associates Inc.
Planned Systems International Inc.
Plantronics Inc.
Plath GmbH
Plug-In Storage Systems Inc.
PM Pundit LLC
PMT RF LLC
Polar Star Consulting LLC
Pole/Zero Corporation
Polycom Federal Systems
Poole & Associates Inc.
Power Analytics Corporation
Power Ten Inc.
powerBridge Computer Vertriebs GmbH
PowerFilm Solar
Powertek Corporation
Praeses
Pragmatics Inc.
Precise Systems Inc.
Precision Assembly Technologies
Preferred Systems Solutions
Preformed Line Products Company
Premier Systems Ltd.
Premier Technical Services
Presidio Networked Solutions
Prevailance Inc.
PricewaterhouseCoopers LLP (PwC)
Prime Solutions
Primescape Solutions Inc.
Princetel Inc.
PRISM Group
Procentrix Inc.
Product Development Technologies (PDT)
Professional Computing Resources Inc.
Professional Solutions LLC (ProSol)
Programmer Resources International Inc.
Programs Management Analytics & Technologies LLC
Progress Software
Progressive Computer Services Inc.
Project Remedies Inc.
PROJECTXYZ Inc.
Promethean Inc.
Proofpoint Inc.
ProSync Technology Group LLC
ProTelecom LLC
Proteus Technologies LLC
PROVEN Inc.
PT Comunicações S.A.
PTC-Integrity Business Unit
PTFS (Progressive Technology Federal Systems)
Pure Integration
PureLink by Dtrovision LLC
Purple Platypus
Pwnie Express
Q-Vio
Qbase LLC
QBE
QinetiQ North America
QUALCOMM Inc.
Quality Incorporated
Quantech Services Inc.
Quantitative Software Management Inc.
Quantrum LLC
Quantum
Quantum Dynamics Inc.
Quest Knight Enterprises LLC
Quest Software Inc.
Quintech Electronics and Communications Inc.
Quintron Systems Inc.
R4 Incorporated
Rackmount Solutions Inc.
RadiantBlue Technologies Inc.
RADIOTECHNIKA-MARKETING SP. Z.O.O.
Radius Technology Group Inc.
Radmor S.A.
RADVISION
RAIT88 s.r.l.
RAM Laboratories Inc.
Raptor Identification Systems LLC
Raritan Inc.
Rave Computer
Raytheon Applied Signal Technology
Raytheon BBN Technologies
Raytheon Canada Limited
Raytheon Company
Raytheon JPS Communications
Raytheon Systems Limited
Raytheon Trusted Computer Solutions

Real-Time Innovations
Recovery Point Systems
Red Gate Group Ltd.
Red Hat
Red Rapids
Red River
REDCOM
REDFOX AG Ruggedized Computers
RedSeal Networks Inc.
RedSky Technologies Inc.
Referentia Systems Inc.
Regis Learning Solutions
REI Systems
Reichenbach International Inc.
Reliable System Services Corporation dba RSS
ReliaQuest LLC
RELM Wireless Corporation
Renaissance Electronics Corporation
Report Verlag GmbH
Reservoir Labs Inc.
RGB Spectrum
RGS
Ricoh Americas Corporation
Ridgeline Technology
RightNow Technologies
RightStar Systems
RInc.on Research Corporation
RISA
RIVA Networks Inc.
Riverbed Technology
Rivermatrix Technologies Inc.
Riverside Research
Riverside Technologies Inc.
Rividium Inc.
RLH Industries
RLM Communications Inc.
RNB Technologies Inc.
Robbins-Gioia LLC
Robert McKeown Company Inc.
Rockwell Collins
Rockwell Collins Deutschland GmbH
roda computer GmbH
roda computer GmbH
Rohde & Schwarz GmbH & Co. KG
Rohde & Schwarz Portugal Lda.
ROHDE & SCHWARZ Praha s.r.o.
Rohde & Schwarz Vertriebs GmbH
rola Security Solutions GmbH
Root Security
Rose Electronics
Route1 Inc.
RPI Group Inc.
RS Components S.p.A.
RSDCGROUP LLC
RTC Group
RuggedCom Inc.
S3LOG
S4 Inc.
Saab AB
Saab International Deutschland GmbH
Sabel Systems
Sabre Government Systems
Sabre Systems Inc.
Sabtech Industries Inc.
Safari GmbH
Safend
SafeNet Germany GmbH
SafeNet Inc.
SAG Deutschland GmbH
Sage Communications LLC
Sage Management
SAIC
Salient Federal Solutions
SANBlaze Technology Inc.
SAP Deutschland AG & Co. KG
SAP National Security Services (SAP NS2)
SAP Public Services Inc.
Sapient Government Services Inc.
SAS
Satcom Direct Communications Inc.
SATLINK Communications
Sava Workforce Solutions
Savantage Solutions
Scalable Network Technologies
Schnoor Industrieelektronik GmbH & Company KG
School of Computing
SCI Consulting Services Inc.
Science Applications International Corporation (SAIC)
SDSU Research Foundation-CCAT
SE Solutions Inc.
Sea Tel Inc.
Seacoast Electric Company, A Division of EIS Inc.
Sealevel Systems Inc.
Seamless Technologies Inc.
Sechan Electronics Inc.
Sectra Communications
secunet Security Networks AG
Secure Communications Systems Incorporated
Secure Consulting LLC (dba Integrated Secure)
Secure Mission Solutions LLC
Secure64 Software Corporation
SecureComm Inc.
SecureSafe Solutions
Security Engineered Machinery Inc.
Security University
Secusmart GmbH
Secuway GmbH
SEFIRA spol. s r.o.
Segue Technologies
Seidcon Inc.
SELEX Communications GmbH
SELEX Elsag
SELEX Galileo
SELEX Sistemi Integrati S.p.A.
Sengex LLC
Sensage Inc.
Sentek Global
Sentrillion
SEPATON Inc.
Sequoia Strategies & Solutions
Serco Inc.
Serena Software
Serena Software GmbH
Sericore LLC
Services and Solutions Group
Servico de Estrangeiros e Fronteiras
Servico de informacoes Estrategicas de Defesa
Servodata a.s.
SES Government Solutions
SESOLInc. Group
Sevatec Inc.
SevOne Inc.
SGI Federal
Shadowsec Unipessoal LDA
Shakespeare Company LLC
Shavlik Technologies
Shephard Media
SHINE Systems and Technologies
Shireen Inc.
ShoreTel
Shunra
SI Organization Inc., The
SIE
SIEMON
Sierra Lobo Inc.
Sierra Nevada Corporation
Sigmatech Inc.
Signal Mountain Networks Inc.
Signamax Connectivity Systems
Silanis Technology
SILICONDEV s.r.l.
Simulyze Inc.
SInc.lair Community College
SINFIC S.A.
SitScape Inc.
Skill s.r.o.
SKY Perfect JSAT Corporation
SkyBuilt Power
Skydex Technologies Inc.
Skyline Software Systems
Skyline-ATS
SkyNet Satellite Communications
Skysoft Portugal
Smartronix Inc.
SMS Data Products Group Inc.
SMS Engineering s.r.l.
SNR Systems LLC
SNVC L.C.
SOCHE
SODATSW s.r.o.
Soft Tech Consulting Inc.
Softchoice Government
SoftConcept Inc.
Softmart
Software AG
Software Engineering Institute
Software Engineering Services Inc.
SOI C4ISR Platforms
Solar Stik
SolarWinds
Solers Inc.
Solutions Technology Inc.
Solutions Through Innovative Technologies Inc.
Sotera Defense Solutions
Spacenet Integrated Government Solutions
Spark Integration Technologies Inc.
SPARTA Inc., a Parsons Company
Spartan Business & Technology Consulting
Spatial Technologies LLC
Spearpoint Associates LLC
Specmat Technologies Inc.
SpecPro Inc.
Spectra Group America Inc.
Spectra Logic Corporation
Spectracom Corporation
Spectrum
SPECTRUM Group, The
Spectrum Mobile Inc. dba Mobile Reach Software Company
Spectrum Systems Inc.
Spirent Federal Systems Inc.
Splunk
Sprint Federal
SPYRUS Inc.
SQS Software Quality Systems AG
SR Technologies Inc.
SRA International Inc.
SRC Inc.
SRI International
SSI
ST NET Inc.
Stancil Corporation
Standard Technology Incorporated
Star Point Corporation
STARGATES Inc.
Stark AeroSpace Inc.
Staybridge Suites Chantilly-Dulles Airport
STE Servizi Tecnici per l'elettronica S.p.A.
steep GmbH
Stellar Solutions Inc.
Steria Limited
STG Inc.
Stock-Point Electronics
StorageHawk
Straight Advisors Limited and Company KG
Straitsys
Stran Technologies
StratCorp Inc.
Strategic Defense Solutions
Strategic Growth Partners LLC
Strategic Operational Solutions Inc.
Strategic Resources Inc. (SRI)
Strategy and Management Services (SAMS) Inc.
Strohmier Consulting LLC (Strategic Partner)
Studio Torta
Succeed to Lead LLC
SUGGS Group Inc.
Sumaria Systems Inc.
Sunair Electronics LLC
Suntron Corporation
Superior Communication Solutions Inc.
Superior Communications Inc.
Superior Essex Communications LP
Superlative Technologies Inc.
SurCom International B.V.
Survice Engineering Company
SUSE Linux GmbH
Suss Consulting Inc.
Sutherland Global Services
Swish Data Corporation
Sybersense
SyES s.r.l.
Sygnetics Inc.
Symantec Corporation
Symetrics Industries
Symmetricom
Syncsort Inc.
Syndetics Inc.
Syneren Technologies Corporation
Synergy Asia Pacific
Syntelligent Analytic Solutions LLC
Synteras LLC
Syntergy Inc.
Synthesis Professional Services Inc.
Syntonics LLC
Sypris Electronics
System & Software Designers Inc.
Systematic Software Engineering Inc.
Systems Technologies Inc. (SYSTEK)
Systems Technology Forum Limited
sysserra computer GmbH
Syzygy Technologies Inc.
T-Mobile USA
T-Systems International GmbH
T-Tech Inc.
Tachyon Networks Inc.
TACO Antenna
Tactical Communications Group LLC
Tactical Electronics Corporation
Tactical Support Equipment Inc.
TAD PGS Inc.
Tampa Microwave
Tandel Systems Inc.
Tangent
Tangent Cable Systems Inc.
Tantus Technologies
TAPE
tapestry technologies LLC
Target Group
TASC
Taurean Corporation, The
TC Communications
TCDI
TE Connectivity (formerly Tyco Electronics)
Tech Electronic Systems
TechConFed LLC
TECHEXPO Top Secret
TECHFOR-Istituto Mides s.r.l.
TechGuard Security LLC
Technica Corporation
Technical Innovation
Technical Systems Integrators Inc.
Technology Advancement Group Inc. (TAG)
Technology Associates International Corporation
Technology Center Inc.
Technology Forums
Technology Management Group
Technology Science Corporation
Technology Specialists Inc.
TechNow Inc.
Tecore NetworksTectia Inc.
TEK Microsystems Inc.
TEKEVER EMEA
Teksouth Corporation Inc.
TEKsystems Inc.
Tektronix Inc.
Telcordia Technologies Inc.
Tele-Consultants Inc. (TCI)
Teleanalys AB
Telecom Business Solutions Ltd.
Telecom Italia S.p.A.
Telecommunication Systems Inc. (TCS)
TELEFUNKEN Radio Communication Systems GmbH and Co. KG
Telegenix Inc.
TELEGRID Technologies Inc.
Telelink Plc
Telesat
Teleskill Italia s.r.l. a Socio Unico
TeleTel Inc.
TeliaSonera Network Sales AB
Teligy Inc.
Telos Corporation
Teng & Associates Inc.
TENICA and Associates LLC
Teracore Inc.
Teradata Government Systems LLC
TeraLogics LLC
TerraEchos Inc.
Terremark Worldwide Inc.
TESAM Argentina SA
TESLA, akciova spolecnost
TESTEQUIPMENT.COM
TetraTech AMT
Tetrus Consulting Group LLC
TEVET LLC
Texas Memory Systems
Thales Alenia Spazio
Thales Communications Inc.
Thales Components Corporation
Thales Defence & Security Systems GmbH
Thales e-Security
Thales e-Security Inc.
Thales Italia S.p.A.
Thales Portugal SA
Thales Systems Romania s.r.l.
Thales UK Ltd.
Themis Computer
Thermacore Inc.
Thinklogical LLC
Thinkom Solutions Inc.
Thomas Jefferson Partnership for Economic Development
Thrane & Thrane
Thundercat Technology
Thunderhead Inc.
Thuraya Telecommunications Company
Thureon International
Thursby Software Systems Inc.
TIBCO Software Inc.
Tilson Government Services LLC
Timbercon Inc.
Time Solutions LLC
Time VM AB
Times Microwave Systems
TITUS
TKC Global Solutions LLC
Tobyhanna Army Depot
Toffler Associates
Topsy Labs Inc.
TopVue Defense Inc.
Total Systems Technologies Corporation
Totaltel Telecom Techniques Limited
Tower Solutions
TPT Technologies Inc. (dba CMstat)
Trace Systems Inc.
TracStar Systems
TRAK Microwave Corporation
Trans-Tel Central Inc.
Transition Networks
Transource Computers
TransQuest Federal Systems
Transtector Systems/Polyphaser
TrellisWare Technologies Inc.
Trend Micro Canada
Trend Micro Inc.
Tresys Technology
TRI-COR Industries Inc.
TRICOM Research Inc.
Tridec Technologies LLC
Trilogy USA Inc.
Trimble Mobile Computing
TriMech
Trinity Empowerment
Trinity IT LLC
Trinity Technology Group
Trinity Video Communications Inc.
Tripwire
TRITON International Inc.
Triune Software Inc. (dba Triune Group)
Tronics Information Systems
Trusant Technologies LLC
TrustComm Inc.
Trusted Systems Inc.
Trustwave Government Solutions
TSI
TSymmetry Inc.
TTC TELEKOMUNIKACE s.r.o.
Turning Technologies
TurningPoint Global Solutions
tw telecom
TWD & Associates Inc.
Twisted Pair Solutions Inc.
twtelecom Inc.
U.S. International Inc.
Ultimate Knowledge Institute
UltiSat
Ultra Electronics-ProLogic
Ultra Electronics Criticom
Ultra Electronics-DNE Technologies
UM Center for Advanced Study of Language
UmeVoice Inc.-The Boom
UMUC
Unanet Technologies
Unimasters Logistics Plc
Unisys Corporation, Federal Systems
United States Antenna Products LLC
United Support Solutions Inc.
Universal Data Exchange LLC (UDX)
Universal Understanding Inc.
Universidade da Beira Interior
Up and Running Inc.
UpStar USA
URS Federal Services
US EXPO & Convention Services
US Tower Corporation
USAA
USCG Deployable Operations Group
USmax Corporation
UTI Systems Inc.
V-Tech Solutions Inc.
VA Associates LLC
VadaTech Inc.
VAE Inc.
Valador Inc.
Valcom Consulting Group Inc.
Valcom Manufacturing Group Inc.
Valicore Technologies
Valkyrie Enterprises LLC
Value Enterprise Solutions Inc.
Van Cleve and Associates Inc.
Van Dyke Technology Group, The
Varen Technologies Inc.
VariQ Corporation
Varonis Systems Inc.
VBrick Systems Inc.
Vector Planning & Services Inc.
Veeam Software Corporation
VEGA Consulting Services Limited
Vello Systems Inc.
Venatore LLC
Ventraq Corporation
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Veris Group LLC
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Verizon Wireless
Versant Corporation
Veteran Corps of America
Veteran Enterprise Technology Services LLC
Veterans Communication Services Inc.
ViaSat Inc.
Video Networks Inc.
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Vigilant Services Corporation
VIMAC Consultancy B.V.
ViON Corporation
Virginia Beach Economic Development Department
Virginia Tech-MIT Program
Virginia Tech Applied Research Corporation
Virginia's Center for Innovative Technology (CIT)
Vision Business Products
Vision Solutions-Double Take
Vision Technologies Inc.
Vision-Box
Vista Technical Services
Visual Innovations Company Inc.
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VMD Systems Integrators Inc.
VMware Inc.
Vocality
Vodafone Global Enterprise
Volt Telecom Group
VT Group Inc.
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Vykin Corporation
W5 Technologies Inc.
Walker and Associates Inc.
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Wave Systems Corporation
Wavefront Technologies Inc.
Wavestream Corporation
We Stream Technologies LLC
Web and Writing Solutions Company
Web-Hed Technologies Inc. (dba Webhead)
Websense Inc.
Webworld Technologies Inc.
WeiTel
WESCO/Communications Supply Corporation
West Anne Arundel County Chamber of Commerce
Whenever Communications LLC
WhipTail
White Peak Capital
White Wolf Systems LLC
Whiteboard Federal Technologies Corporation
Whitlock Group, The
Whitney, Bradley & Brown Inc.
WillCo Technologies Inc.
Wilson Case Inc.
Wind River
Windmill International Inc.
Windward IT Solutions
Winncom Technologies
Winsted Corporation
Winvale
WolfVision Inc.
World I.T. Solutions (W.I.T.S.) LLC
World Wide Technology Inc.
Worldwide Information Network Systems Inc.
WRG Management Services
WTI
WTOP and Federal News Radio
Wyle
X-COM Systems
X-Feds Inc.
Xceedium
Xenotran Incorporated
Xerox-NARS
XSCIO AG
XTAR LLC
Yashi Italia
Yorktel Corporation
Yorktown Systems Group Inc.
Z2 Technologies LLC
ZAI Solutions Inc.
Zarges Inc.
Zel Technologies LLC (ZelTech)
Zenetex LLC
Zentech Manufacturing Inc.
ZERO Manufacturing Inc.
Zhone Tech Inc.
ZiBiz Corporation

INTERNATIONAL

CHAPTER NEWS

Edited by Rachel Eisenhower

EDITORIAL POLICY: Chapter News must be received by the 20th of the month two months prior to publication date.

Alamo

Navy Medicine Infrastructure Explored

At the chapter's July luncheon, guest speakers included Dr. Peter Marks, chief operating officer, Navy Medical Information Systems Support Agency, along with Lt. Hunter Coates, USN, and Lt. Timothy Gates, USN. Marks described the Navy medicine infrastructure and stressed the importance of organizational strategy. He discussed complex challenges faced by everyone in the information technology (IT) industry today, including portfolio management, balancing IT operations with IT innovations and making choices among competing initiatives. Marks emphasized that valuable IT tools cannot be rushed. He acknowledged that although the process is not fast, it works. Lt. Coates and Lt. Gates gave detailed insights into portfolio management.

Argentina

Course on New Audiovisual Platforms

In August, the chapter sponsored a professional development course titled "New Audiovisual Content Platforms," which took place at the Argentine Army's Escuela Superior Técnica in Buenos Aires. The event attracted nearly 130 attendees and 32 lecturers. Luis Valle and Claudia Cardama coordinated the course, which included presentations about terrestrial digital TV, digital satellite TV, mobile TV, over-the-top TV (OTT), Internet protocol TV (IPTV) and digital cinema, among others. In addition, seven companies hosted workshops and presentations of their products, and attendees viewed a digital TV transmission. The guest speakers and attendees included members of government, industry, academia and the armed forces.

ArkLaTex

STEM Scholarship Honors Teacher

In July, Col. Andy Thomson, USAF (Ret.), chapter board member, presented Breanne Hughes with a $5,000 check and certificate for winning the STEM Teachers for America's Future Scholarship. The scholarship assists students actively pursuing an undergraduate degree, graduate degree or credential/licensure for the purpose of teaching science, technology,

General Kicks off Tech Expo

Kaiserslautern

KAISERSLAUTERN—In July, Lt. Gen. Mike Peterson, USAF (Ret.), kicks off the chapter's Summer Tech Expo by highlighting the tremendous value of AFCEA and these events for professional relationships.

Lt. Gen. Mike Peterson, USAF (Ret.), kicked off the chapter's Summer Tech Expo in front of an anxious crowd in July at Ramstein Air Base, Germany. In cooperation with the United States Air Forces in Europe's Directorate of Communications, the chapter hosted more than 70 vendors to showcase their latest technologies. The chapter offered an exclusive VIP preview to senior leaders on base. Officers from the U.S. Air Force, U.S. Army, German Air Force and Turkish Air Force took advantage of the time to talk one-on-one with the vendors about solutions to optimize or expand their mission capabilities. Gen. Peterson commented on how he was impressed with the packed house and how strong the chapter has remained since his involvement. He reminisced about his time as the director of communications and information systems, headquarters U.S. Air Forces in Europe, from December 1996 to June 2000, stating, "I lived off the contacts and networking from AFCEA." The general continued to discuss how the military is transforming to embrace cyber in a joint fashion.

During the expo, the chapter also hosted seven seminars that allowed the speakers to dive into the details of topics such as virtual desktop infrastructure, cybersecurity, and command and control. Overall, the chapter deemed the expo a huge success, with 844 visitors visiting the exhibit hall and 128 attending seminars.

KAISERSLAUTERN—Allied senior leaders from the Kaiserslautern military community pass through the red-carpet opening of the Summer Tech Expo in July.

Chapter News Online

For extended articles and information on how your chapter can be published in *SIGNAL*, visit www.afcea.org/signal/chapternews

engineering and mathematics (STEM) subjects at U.S. middle or secondary schools. The chapter board selected Hughes from a pool of highly qualified nominees submitted throughout Arkansas, Louisiana and Texas.

Atlanta

Colonel on Cyberspace Mission

The chapter invited Col. Joseph H. Scherrer, USAF, to speak at its July luncheon held at the Dobbins Consolidated Club in Atlanta. Col. Scherrer is commander of the 689 Combat Communications Wing at Robins Air Force Base, Georgia. His unit reports to the 24th Air Force (24AF), Air Force Space Command. The role of the wing is to extend, operate and defend the cyberspace in a deployed mission. It is the expeditionary arm of the 24AF that is set up to deploy worldwide—anytime, anywhere. The colonel tailored his presentation for the uncleared audience due to the classified capabilities of his unit and its unique mission. Col. Scherrer did not disappoint the chapter and provided inspirational philosophies and analogies for his mission. He related the impact of his organization to U.S. citizens.

Chapter Installs New Officers

The chapter elected new officers during the July luncheon at Dobbins Air Force Base, Georgia. The ballot voting results were unanimous, which allowed for immediate installation of the officers. The chapter elected Mitch Abel as president for the second year running. Col. Patricia Harrington, USAF (Ret.), regional vice president, joined the event to install the new officers into the chapter.

ALAMO—In July, Dr. Peter Marks (r), chief operating officer, Navy Medical Information Systems Support Agency, receives a special thank you from Bill Morrow (2nd from r), chapter president, alongside Lt. Timothy Gates, USN (2nd from l), and Lt. Hunter Coates, USN, fellow luncheon speakers.

ALAMO—Board members posing with the chapter's Model Chapter Award in July are (l-r) Capt. Brian Higgins, USAF, chapter vice president for programs; Karin Grace, secretary; Morrow; Emily Rausch, Young AFCEAN adviser; Bill Robinson, chapter vice president for corporate affairs; and Tom Allen, chapter vice president for membership.

ATLANTA—Col. Joseph H. Scherrer, USAF, commander, 689 Combat Communications Wing, Robins Air Force Base, Georgia, addresses the chapter in July and shares his philosophy on conducting cyberwarfare in a challenging political atmosphere.

ATLANTA—Mitch Abel (r), chapter president, presents Col. Scherrer with a chapter coin following his speech at the July meeting.

ATLANTA—In July, the chapter re-elects Mitch Abel as its president for the second year.

ATLANTA—Col. Patricia Harrington, USAF (Ret.) (l), regional vice president, installs the chapter's 2012-2013 officers in July.

ARGENTINA—Luis Valle welcomes attendees in August to the chapter's professional development course, which addressed audiovisual content platforms.

ARGENTINA—Rear Adm. Emilio Nigoul, ARA (Ret.) (r), chapter president, presents a certificate of recognition to Miguel Pesado, ARSAT manager, who spoke at the chapter's course in August.

ARGENTINA—In August, Adm. Nigoul (l) presents a certificate to an attendee of the chapter's course titled "New Audiovisual Content Platforms."

ARKLATEX—Breanne Hughes, winner of the STEM Teachers for America's Future Scholarship, receives a check and certificate from Col. Andy Thomson, USAF (Ret.), chapter board member, in July.

WEST 2013

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- **Military Satellite Communications in a Net-Centric Environment**
- **(ISC)² DoD CAP — Certification & Accreditation Professional**
- **Contracting with Uncle Sam**
- **AFCEA Leadership Forum**
- **Electromagnetic Environmental Effects (E3) and Spectrum Supportability (SS) for Program Managers**
- **Social Media Security Engineer & Forensics Professional** (with certification exam)
- **Social Media Security Training** (with SMSP Certification Exam Powered by CompTIA)
- **Social Media Management & Governance** (with certification exam)

For full course descriptions, instructor bios, and registration, see professional development at www.westconfexpo.org

January 29 – 31, 2013 | San Diego Convention Center | **www.westconfexpo.org**

BONN E.V.—Young AFCEANs from the Bonn and Kaiserslautern chapters visit the Ramstein Tech Expo in July as part of the first joint event organized by Jochen Reinhardt (5th from r), chapter Young AFCEAN representative, and Master Sgt. Douglas Brock, USAF (4th from r), Kaiserslautern Chapter.

GREATER OMAHA—Col. Kirk Bruno, USMC (Ret.) (l), chapter president, receives a memento for his service to the chapter from Roy King, chapter vice president for programs, in July.

GREATER OMAHA—Col. Bruno (l) congratulates Andrew Stetson, operations analyst, Strategic Network Operations Center, U.S. Strategic Command, who won the grand prize, a new Nexus 7 Tablet donated by Google, at Tech Day in July.

GREATER OMAHA—At Tech Day in July, Col. Bruno (l) joins Lenny Schaefer, director, U.S. Air Force business development, URS Federal Services, Chantilly, Virginia, at the URS booth.

GULF COAST—Tom Gwaltney (l), regional vice president, presents Maj. Jeffrey J. Gomes, USAF, chapter president, with the Model Chapter of the Year Award for 2012 at the July luncheon.

GULF COAST—In July, the chapter welcomes Brig. Gen. Jeffrey Kendall, USAF, director, warfighter systems integration, Office of Warfighting Integration and Chief Information Officer, as the featured guest speaker.

Bonn E.V.

Young AFCEANs Crack Regional Boundaries

For the first time, Young AFCEANs from the Kaiserslautern and Bonn chapters organized and met for a joint event at Ramstein Air Base in Germany. The chapter organized travel to the air base for 10 Young AFCEANs from Bonn and Koblenz in July. There, Master Sgt. Douglas Brock, USAF, and Master Sgt. Todd Weingeroff, USAF, of the Kaiserslautern Chapter organized information technology (IT) briefings and a small tour. Together, they discussed the efforts and experiences of the Air Force to consolidate its unclassified networks and IT services for approximately 400,000 users worldwide. The Young AFCEANs also gained insight into the IT services on base as well for all U.S. installations in Germany. Young AFCEANs from both chapters regarded the event a success, and they plan to host another event in the future in the Bonn area, Jochen Reinhardt, chapter Young AFCEAN representative, said.

Greater Omaha

State of the Chapter Luncheon

In July, Col. Kirk Bruno, USMC (Ret.), chapter president, provided an overview of the chapter's general health and accomplishments for the 2011-2012 term. Col. Bruno highlighted how the chapter remained engaged, representing its needs to AFCEA International and recruiting new members and volunteers. He also discussed the chapter's recognitions for the year: the Model Chapter Award, a Regional Distinguished Young AFCEAN, two Medal of Merit recipients and one Leadership Award winner. The colonel concluded by touching on the chapter's major calendar events as well as its goals for the 2012-2013 term and encouraging general membership participation throughout.

Colonel Discusses Cyberspace Operations

In June, Lt. Col. Robert Anderson, USAF, U.S. Strategic Command, Offutt Air Force Base, Nebraska, discussed the integration of cyberspace operations and how the Defense Department will provide future capabilities. Col. Anderson described his experience as an exchange officer with the Ministry of Defence, including how the United Kingdom provides for network defense capabilities and how his experience has given him additional perspective on network defense. He covered the currently accepted definitions of cyberspace and cyberspace operations, which he believes will continue to evolve. Col. Anderson expounded on how the Joint Forces commander (JFC) will execute cyberspace operations and how the JFC will achieve cyberspace superiority. He briefly discussed network defense operations and how they relate to currently existing malicious software "in the wild" today. The colonel concluded by providing his perspectives on the cost of cyberspace operations relative to kinetic operations and by noting that cyberspace operations will need to be more cost effective.

NCI Agency & AFCEA Europe

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NATO Communications & Information Agency (NCI Agency) will hold its first Industry Conference in partnership with AFCEA Europe's TechNet International from 23-25 October in Rome, Italy at the Parco dei Principi Grand Hotel.

WELCOME ADDRESS:

- **Mr. Koen Gijsbers,** General Manager, NCI Agency
- **Maj.Gen. Klaus-Peter Treche, DEUAF (Ret.),** General Manager, AFCEA Europe

KEYNOTE SPEAKERS INCLUDE:

- **His Excellency Admiral (Ret.) Giampaolo Di Paola,** Minister of Defence of Italy (t.b.c.)
- **Ambassador Alexander Vershbow,** Deputy Secretary General of NATO (t.b.c.)
- **General Mieczyslaw Bieniek,** Deputy Supreme Allied Commander Transformation (t.b.c.)
- **LtGen Walter E. Gaskin, USMC,** Deputy Chairman, NATO Military Committee
- **LtGen S.A. Claudio Debertolis,** National Armaments Director, MOD IT
- **Mr. Giuseppe Orsi,** CEO, Finmeccanica
- **Mr. Steven Sprague,** President and CEO, Wave Systems Corp.

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- NATO Agency Reform
- Smart Defence & Industry
- Future Mission Network and SATCOM Improvements
- Big Data and NATO Cloud
- C4ISR Systems and Technology
- NCI Agency Business Opportunities Introduction
- Unmanned Technology
- Cyber Security and Mission Assuredness

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INDUSTRY CONFERENCE & TECHNET INTERNATIONAL

Rome Italy 2012

NATO Communications and Information Agency

HAMPTON ROADS—Whit Ludington (l), chapter president, presents August chapter awards to (2nd from l-r) Jodi Ellison, information technology specialist, Marine Corps Forces Command (MARFORCOM) G-6, Civilian Cyber Professional; Capt. Glenn Berdela, USMC, amphibious communications officer, MARFORCOM G-6, Military Cyber Professional; and Marian Parker, information assurance manager, AUSGAR, AFCEAN of the Month; along with guest speaker Col. Kenyon Gill, USMC, chief information officer, MARFORCOM G-6, and attendee Lt. Cmdr. Dave Pereira, USN, chapter vice president for military affairs.

HAMPTON ROADS—Awardees of the Grassfield High School Technology Academy's Mentorship Program honored at the August luncheon are (l-r) Mitchel Weate, SimIS Incorporated; Kevin Lewis, student; Bob Banach, DT Read Steel Company; Kyle Salladay, student; Ludington; and Amie Beahm, Grassfield High School mentorship coordinator.

HAMPTON ROADS—Col. Gill addresses the chapter at its August luncheon.

HAWAII—Gordon J. Bruce, chief information officer for the city and county of Honolulu, discusses professional development opportunities during the chapter's Young AFCEAN Appreciation luncheon in July.

HAWAII—Gathering at the July luncheon are Ilan Amir (l), chapter Young AFCEAN chair for industry, and 1st Lt. James P. Micciche, USA, chapter Young AFCEAN chair for the Defense Department.

Gulf Coast

Model Chapter Award Presented

Brig. Gen. Jeffrey Kendall, USAF, director, warfighter systems integration, Office of Warfighting Integration and Chief Information Officer, delivered remarks at the chapter's July luncheon at the Bay Breeze Event Center, Keesler Air Force Base, Mississippi. The chapter also received its third consecutive Model Chapter of the Year Award, which recognizes the top overall chapter structure and program of activities for the year.

Hampton Roads

Colonel on Supporting Marines

Col. Kenyon Gill, USMC, chief information officer/G-6, U.S. Marine Corps Forces Command (MARFORCOM), spoke to the chapter at its August luncheon. Drawing from his experience with MARFORCOM, Col. Gill gave insight into the overall workings of the Marine Corps and how his team supports its operational efforts. Due to the nature of Marine deployments, the communications, information technology support and logistics have to be self-contained within the expeditionary force, and Marines must be prepared to operate without reliance on the other services for any assistance for days and sometimes weeks.

Hawaii

Luncheon Honors Young AFCEANs

The chapter had its first annual Young AFCEAN Appreciation luncheon in July at the Hale Ikena located on Fort Shafter. The event was a huge success as the chapter recognized Young AFCEANs from across the state of Hawaii by providing their luncheon ticket along with special seating and a chance to network with their peers as well as leaders in industry across the islands. Additionally, guest speaker Gordon J. Bruce, chief information officer for the city and county of Honolulu, catered his presentation to the development of the young professionals that make up the chapter's Young AFCEANs.

Hellenic

Seminar on Information Technology Developments

In June, the chapter successfully organized an educational seminar on "Telecommunications and Computer Networks" at the Hellenic Air Force's 128 Training Group for Communications and Electronics in Kavouri, Athens. The group's commander, Col. S. Amourgianos, HEAF, and Maj. Gen. D. Kateloúzos, HEAF (Ret.), a member of the chapter's Executive Committee, opened the event. The seminar detailed key areas of communications and information technology, including descriptive presentations on issues such as transmission concepts, links, media and techniques, telephony, LANs-WANs, high-speed digital transmission, ISDN and more. Additionally, it highlighted some convergence examples for an efficient and sustainable use of information and

communication technology, specifically voice and data convergence on common communication networks and infrastructure; fixed and mobile telephony convergence, which often includes consolidation of infrastructure; and services and content convergence, where any form of information can coexist. The chapter plans to organize similar training for the Hellenic Army and Navy.

Huntsville

Army Expert Talks Cyber

In July, the chapter welcomed Richard Russell, deputy G-2, U.S. Army Materiel Command (AMC), as its guest speaker. Russell is a founding member of the U.S. Department of Homeland Security and a recognized expert in the fields of organizational and program transformation as well as information integration. His current assignment as deputy G-2 of the AMC, one of three major commands in the Army, gives him an educated and in-depth perspective in the area of cybersecurity. Russell spoke about cyberwarfare as a key battleground of the Information Age and the current U.S. strategy regarding cyberwarfare. He drew a comparison between the current U.S. cyberwarfare strategy and the strategy during the Revolutionary War. He also informed the audience that the United States is currently in fifth place in the war for cyberdominance. The luncheon concluded with the chapter awarding three $1,000 Lonnie Polling Memorial scholarships.

Kaiserslautern

The Future of Cyberspace

Chapter members focused on the future of cyberspace during the June meeting. The event began with a presentation by a freshman from Ramstein High School, Aaron Gaudette, who represented his school's Science, Technology, Engineering and Mathematics (STEM) Club. His team attended a regional STEMposium in Oberwesel, Germany, in April with assistance from a $1,000 donation from the chapter. Gaudette's team conquered numerous scenarios, such as a bursting dam, by approaching the challenges analytically and devising a comprehensive solution. Next, the chapter awarded $20,000 in scholarships to graduating high school seniors. These future AFCEANs include Samuel Wetlesen, Stephen Guenther, Dylan Sharpy, Patrick O'Neal, Rachel Hook and Erik Langholz. Finally, the chapter's guest speaker, 1st Lt. Robert M. Lee, USAF, spoke about the future of cyberspace. He related the current struggle with cyberspace to the interim years of airpower when advocates defined the domain by challenging perceptions. "We have to lead and advocate for the domain," he said.

Montgomery

Education Foundation Recognizes Awards Winners

The chapter's Education Foundation celebrated another successful year in furthering educational careers and programs at its

HELLENIC—Attendees of the June seminar on "Telecommunications and Computer Networks" include officers from the Hellenic Air Force 128 Training Group for Communications and Electronics, seminar graduates and the chapter's Executive Committee.

HELLENIC—Col. S. Amourgianos, HEAF (l), and Lt. Gen. Leonidas Mazarakis, HAF (Ret.), chapter president, exchange a token of appreciation at the June seminar.

HUNTSVILLE—In July, Victor Budura (l), chapter president, presents John Roberts, Nextek, with an AFCEA Corporate Partner Certificate on behalf of his company.

HUNTSVILLE—Richard Russell, deputy G-2, U.S. Army Materiel Command, addresses the chapter at its July luncheon.

HUNTSVILLE—Scholarship winners and board members gathering in July are (l-r) Michael Schexnayder, Oluwatobi Ojewole, Patrick Monroe, Bridgette Howard and Budura.

KAISERSLAUTERN—The chapter welcomes visitors to its July event, which brought in 54 new AFCEA members.

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Confirmed Speakers & Panel Participants Include:

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- **Ms. Teri Takai,** Chief Information Officer, U.S. Department of Defense
- **Mr. Terry Halvorsen,** Chief Information Officer, Department of the Navy
- **RADM Charles W. Ray, USCG,** Commander, 14th Coast Guard District
- **Brig Gen J. Marcus Hicks, USAF,** Director, Communications Systems, J6, U.S. Pacific Command
- **Mr. Marcus Sachs,** Vice President, National Security Policy, Verizon

Panel Topics Include:

- DoD CIO Panel
- Industry Day Panel – "The U.S. Tilt to the Asia-Pacific Region – What Does It Mean for Industry?"
- Pacific Realignment Panel – "Reallocating Resources to Meet the Challenges and Opportunities in the Asia-Pacific"
- U.S. PACOM Panel
- Young AFCEAN Panel – "Doing More With Less"

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QUESTIONS?

Registration & exhibit information:
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Patron/sponsor information:
Contact Gina McGovern at (703) 631-6236 or gmcgovern@afcea.org

Other questions:
Contact Terry Rogers at (703) 631-6238 or trogers@afcea.org
or Pat Holmes at (703) 631-6130 or pholmes@afcea.org

annual awards luncheon held at Wynlakes Country Club in July. The guest speaker, Chief Master Sgt. Brye McMillon, USAF (Ret.), encouraged parents, students and community members to teach boundaries and to help children grow in the fields of science, technology, engineering and mathematics (STEM). In that spirit, the foundation presented 2012 High School Intern Program grants, Education for Industry and STEM scholarships, as well as grants to local robotics programs. In the High School Intern Program, each graduating senior earned a grant of $2,500, a $3,500 10-week paid internship and an HP laptop. Education for Industry and STEM Scholarship winners received $5,000 to further their education. Finally, the foundation granted $5,000 to award-winning robotics programs in Macon County and Wetumpka High School. The foundation is dedicated to helping the Montgomery community continue to prosper.

North Carolina

Board Launches Fresh Start

The chapter swore in its new president and board members for 2013 during the monthly board meeting held on Fort Bragg in July. Jane Brightwell, regional vice president, presided over the ceremony for the new board officials. In her remarks, she thanked outgoing president Jerry Stidham for his dedication to serving the chapter and organization. She recognized his work in leading the chapter to become one of the strongest in the area. Stidham thanked the board and attending members for their service to the chapter. During Stidham's tenure, the chapter doubled its member base and presented nearly $60,000 in scholarships to worthy students and teaching programs in the area. Newly elected president Paul Reimers added his thanks to Stidham and the board for a job well done. Reimers takes the reins of the chapter after serving as president on three different occasions with other AFCEA chapters.

San Diego

New Scholarships Awarded

The chapter awarded 10 new scholarships to students from around the county in July, including Sarah Nichols and Kevin Dong, who each received a Buck Bragunier Leadership Scholarship for $2,000. Nichols graduated in 2012 from San Pasqual High School and will attend Harvey Mudd College in the fall to major in engineering. Dong graduated in 2012 from Mount Carmel High School; he will attend the University of California Los Angeles in the fall to major in computer engineering. Charlotte Orren received the San Diego County $8,000 Scholarship along with high school recipients Gautam Soundararjan, Raymond Wu and Margaret Guy. The AFCEA San Diego/AVID Scholarship, which awards high school graduates with a one-time $2,000 grant, went to Thu Hoang, Maria Duran-Juanche and Devin Dang. The Science, Technology, Engineering and Mathematics (STEM) Internship Grant for $2,000 went to Preetam Soundararajan for his winning project titled, "The

KAISERSLAUTERN—In July, Summer Tech Expo visitors register before taking in more than 70 different vendors showcasing their latest technologies and solutions.

MONTGOMERY—Charisse Stokes (4th from r), director of the chapter's Education Foundation, and Chief Master Sgt. Brye McMillon, USAF (Ret.) (l), congratulate student winners at the chapter's annual education awards luncheon in July.

NORTH CAROLINA—At the July meeting, Jerry Stidham, past chapter president, turns over the reins to a new president and board.

MONTGOMERY—In July, Stokes (4th from l) and Sgt. McMillon (4th from r) present scholarships from the chapter's Education Foundation at its annual awards luncheon.

NORTH CAROLINA—Paul Reimers, incoming chapter president, addresses the board after his induction ceremony in July.

NORTH CAROLINA—Newly inducted members of the chapter's 2012-2013 board look toward the future at the July meeting.

AFCEA EDUCATIONAL FOUNDATION SCHOLARSHIPS

Cyber Studies Scholarship Program
With the generous support of Booz Allen Hamilton, CSC, Lockheed Martin, Powertek, SANS, Terremark, the AFCEA Cyber Committee, AFCEA International, and the AFCEA Educational Foundation, the following Cyber-related scholarships are offered:

Cyber Studies Scholarships
Scholarships of $5,000 will be awarded to students majoring in a field directly related to the support of U.S. Cyber enterprises such as cyber security, cyber attacks, computer science, information technology, digital forensics, or electronic engineering. An overall GPA of 3.0 is required.

Young AFCEAN Cyber Certification Scholarships
Scholarships of $1,000 will be awarded to Young AFCEANs (age 40 or under) who are currently pursuing a DOD 8570.01-M Certification. Enrollment in an AFCEA Professional Development Center (PDC) Cyber Security course is eligible.

Deadline: November 1, 2012

Intelligence Scholarships
Co-sponsored by Battelle, Digital Realty, Linquest, and Terremark (A Verizon Company), AFCEA Intelligence and the AFCEA Educational Foundation offer scholarships aimed at students pursuing academic degrees in global security, intelligence studies and/or foreign languages.

Undergraduate scholarships of $2,250 and graduate-level scholarships of $5,000 will be awarded to students enrolled full time in an eligible field such as Global Security and Intelligence Studies (GSIS) or foreign language. Applicants must be U.S. citizens with a minimum overall GPA of 3.0 on a 4.0 scale. Distance-learning or online programs are eligible.

Deadline: November 1, 2012

Scholarships for Afghanistan and Iraq War Veterans
Cosponsored by the AFCEA Northern Virginia Chapter and the AFCEA Educational Foundation, scholarships of $2,500 will be awarded to active-duty and honorably discharged U.S. military veterans of the Enduring Freedom or Iraqi Freedom operations who are actively pursuing an undergraduate degree in an eligible major. Full or part-time students attending accredited two or four year schools in the United States in either traditional or distance-learning programs are eligible.

Deadline: November 15, 2012

Scholarships for Disabled War Veterans
Co-sponsored by Microsoft employees, the AFCEA Camp Pendleton Chapter and the AFCEA Educational Foundation, scholarships of $2,500 are offered to active-duty service personnel, honorably discharged U.S. military veterans, reservists, and National Guard personnel who are disabled because of wounds received during service in Enduring Freedom-Afghanistan or Iraqi Freedom Operations. Applicants must be actively pursuing an undergraduate degree in an eligible major. Full or part-time students attending accredited two or four year schools in the United States in either traditional or distance-learning programs are eligible.

Deadline: November 15, 2012

Applications available at scholarships.afcea.org

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Purpose:
The AFCEA International Small Business Program is designed to strengthen the association by enhancing benefits for our members.

Value proposition for AFCEA Small Business members:
The primary focus is on building value for AFCEA Small Business Corporate members. Small business programs, however, have the potential to serve all AFCEA stakeholders – government, industry (large & small), and individual members.

The following goals are designed to strengthen the value proposition for members:
- Create an ethical forum where capable small businesses can increase visibility, identify teammates/partners and successfully compete for federal procurements;
- Educate established small businesses to support development, growth, and success in the federal government market;
- Prepare small businesses to approach government & large business in an efficient way;
- Assist large businesses to facilitate subcontracting opportunities for small businesses;
- Assist government agencies in identifying small businesses to meet their SB award goals.

www.afcea.org/smallbusiness

SAN DIEGO—In July, the chapter honors its new scholarship recipients.

SAN DIEGO—The chapter's July luncheon draws a large crowd for the scholarship presentations.

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Creation of Photo Luminescent Nanoparticles Generated from Ultrasonic Fracture for in-vivo Imaging."

South Carolina Low Country

SPAWAR Scientist Addresses Chapter

The chapter held its monthly luncheon in August at the Crowne Plaza hotel in North Charleston, South Carolina, where the guest speaker, Dr. Al Emondi, gave a presentation on the strategies and structure of science and technology at the Space and Naval Warfare (SPAWAR) Systems Center Atlantic. Emondi is the science and technology competency lead, discovery and invention business portfolio manager and deputy chief technology officer at SPAWAR Atlantic.

STEM Award Presentation

The chapter, on behalf of the AFCEA Educational Foundation, presented a $5,000 science, technology, engineering and mathematics (STEM) scholarship to Caroline Stalvey. Stalvey, a resident of Georgetown, South Carolina, is a rising senior at Clemson University, where she is majoring in mathematics. The chapter made the presentation during its July membership luncheon. Stalvey accepted her award along with her father John.

Tampa-St. Petersburg

Donation Helps Veteran Family

On June 7, local firefighters rushed to a two-alarm fire at the Baldwin family's Brandon home near Tampa, Florida. Craig Baldwin and his wife Linda, both retired noncommissioned military officers, their son, Brandon, 21, their daughter, Chereese, 32, and Chereese's 5-year-old daughter, Miracle, were not home at the time. Unfortunately, the fire ravaged the home and claimed the life of their family dog. In a strong surge of support, the chapter quickly voted to donate all monies raised at the June monthly luncheon to the family to buy much needed items. As Craig Baldwin accepted the generosity, luncheon attendees were inspired by his words of faith: "We'll get by. God doesn't put anything on our shoulders we can't get through."

Tidewater

General on Cyberspace Issues

Maj. Gen. Earl D. Matthews, USAF, director, cyberspace operations, Office of Information Dominance and Chief Information Officer, Office of the Secretary of the Air Force, served as the keynote speaker during the July luncheon. The general provided an overview of current cyberspace issues and hot topics. He explained the efforts underway to reduce the number of networks, improve efficiencies and reduce cost through data center consolidation; the Joint Information Environment initiative; and enterprise licensing of software. Gen. Matthews also highlighted improvements in developing the cyber

SOUTH CAROLINA LOW COUNTRY—In July, Caroline Stalvey, a rising senior at Clemson University, receives her $5,000 science, technology, engineering and mathematics scholarship from Tony Orlando (l), chapter president, while her father John looks on.

SOUTH CAROLINA LOW COUNTRY—Dr. Al Emondi, lead scientist, Space and Naval Warfare Systems Center Atlantic, addresses the chapter in August.

TAMPA-ST. PETERSBURG—Mark Christensen (r), chapter first vice president, presents a check to Craig Baldwin on behalf of the chapter at its June luncheon. A fire destroyed the Baldwin family home earlier that month.

TIDEWATER—Col. Glenn Powell, USAF (l), chapter vice president, presents Maj. Gen. Earl D. Matthews, USAF, director, cyberspace operations, Office of Information Dominance and Chief Information Officer, Office of the Secretary of the Air Force, with a chapter polo shirt in July.

TIDEWATER—Chapter members (l-r) Corey Kinsler, Braxton Ward and William Benson interview a Hampton middle school student on the journal maintained in preparation for the July unmanned aerial vehicle competition.

TIDEWATER—In June, Ken Hirlinger (r), chapter president, presents a U.S. Air Force poker chip set to raffle winner Airman 1st Class Craig Maxson, USAF, 10th Intelligence Squadron.

TIDEWATER—During the June luncheon, Bill Marion (r), past chapter president and chief technical officer, headquarters Air Combat Command Communications and Information, Langley Air Force Base, receives the Air Force Meritorious Civilian Service Award from Col. Glenn Powell, USAF, chapter vice president.

civilian work force, managing assignments of the larger community of cyber-related career field assignments and cybertraining enhancements made to the Scope Eagle course at Keesler Air Force Base.

Chapter Supports Local UAV Teams

In July, the chapter provided cash donations and co-sponsored two Mini-UAV (unmanned aerial vehicle) competitions for three local teams: AERO Services, Zenith Challenge Project and Synergy Hampton Roads. These teams teach students about basic flight principles for UAVs, including design and fabrication, and attend competitions at the local and collegiate levels. Synergy Hampton Roads took 10 high school students to Patuxent River, Maryland, in mid June for the international collegiate competition. AERO Services wrapped up its second session of instruction for middle school students with a Mini-UAV Competition at Air Power Park and Museum in Hampton. The competition was co-sponsored by the chapter and Hampton Parks and Recreation.

Changing Communication Dynamics

The June luncheon featured guest speaker Bill Marion, past chapter president and chief technical officer, headquarters Air Combat Command Communications and Information, Langley Air Force Base, Virginia. Marion hit home the message of the changing dynamics by which people communicate in today's society and how there is an expectation of similar communication methods in the Defense Department/Air Force. He provided statistics, including the fact that more social media communications occur than email, and that Web surfers have proven to be 9 percent more productive at work. Previous communication mechanisms are evolving, and the Defense Department has to evolve as well, he related. For example, instead of purchasing expensive hardware/software "bricks," more applications, including within the Defense Department, are migrating onto relatively inexpensive mobile devices that can communicate and perform mission application processing and command display. Marion's next assignment is in Colorado, where he will be assigned as chief technology officer for Air Force Space Command.

The auditorium complex in AFCEA International's headquarters is available for rent.

For more information, contact Nancy Temple at (703) 631-6111.

TWENTYNINE PALMS—Members of the newly formed chapter gather in June for a kickoff luncheon along with Doug Holker (2nd from l), regional vice president, and Col. Mike Warlick, USMC (Ret.) (l), vice president for regional and chapter outreach, AFCEA International.

TWENTYNINE PALMS—Brig. Gen. George W. Smith Jr., USMC, briefs attendees at the chapter's first luncheon in June.

TWENTYNINE PALMS—In June, luncheon attendees hear from guest speaker Gen. Smith during the chapter's inaugural luncheon.

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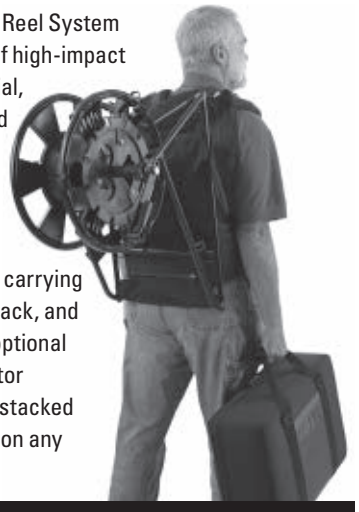

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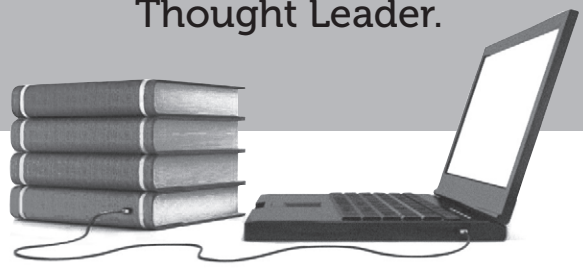

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Evolution is Leading Us to Software-Defined Networks

By Paul A. Strassmann

The next step in the transformation of the U.S. Defense Department systems architecture will be networks defined by software instead of by hardware. Software-based network controls will extend the scope of what currently is limited only to data center operations.

Traditionally, switches and routers have been set separately from what was managed as computing inside the data center. Special-purpose devices were installed to solve specific problems of network management. This resulted in complexity and inflexibility. For example, to change networking data centers, operators had to reconfigure switches, routers, firewalls or Web authentication portals. This required updating virtual local area networks, quality-of-service settings and protocol-based tables with dedicated software tools. Network topology, as well as different software versions, had to be taken into account. Consequently, the networks remained relatively static because operators sought to minimize the risk of service disruption from hardware changes.

Enterprises today operate multiple Internet protocol networks for voice, data, sensor inputs and video. While existing networks can provide custom-made service levels for individual applications, the provisioning of network resources largely is manual. Operators configure each vendor's equipment and adjust parameters, such as bandwidth, on a per-session, per-application basis. Because of the static nature, networks cannot adapt to changing traffic, application and user demands. With an estimated 15,000 networks in place, the Defense Department has difficulty managing such a proliferation of options.

The explosion of mobile devices, server virtualization and the advent of cloud services now are driving networking firms to re-examine how to make the communications control more flexible. Hierarchical networks constructed with hard-wired Ethernet devices arranged in multiple tree structures cannot sustain the new workloads. A static architecture is ill-suited for the computing and storage needs of current computing and carrier environments.

Within an enterprise environment, communications traffic patterns are changing. In contrast to client-server applications where the bulk of the communication occurred between one client and one server, today's virtual applications access different databases, creating a geographic diversity of machine-to-machine traffic before returning data to the end user. Users are changing network traffic patterns instantly as they push for access to dispersed content. Applications require access from any type of device, connecting from anywhere, at any time, by any access method.

Managers of enterprise data centers are proceeding to adopt a utility computing model, which includes private, public cloud and hybrid clouds. This results in traffic that is distributed over a dispersed area. It now is a requirement that the management of highly adaptable networks can change configuration without any delay.

Enterprises have embraced a wide range of cloud services, resulting in an unprecedented growth of these services. Enterprise business units want to access applications, infrastructure and diverse resources from multiple locations. To add to the complexity, the planning for cloud services must be done in an environment of increased security and auditing, along with changing business reorganizations, consolidations and mergers that can change switching without delay. Instant access is necessary to secure rapid scaling of computing, storage and network resources with a common suite of configuration tools. At present, it may take many weeks before even a small change in the pattern of communication can be altered. New equipment must be bought, relocated and tested before wide-area traffic can be allowed to flow. Response time in seconds is the new requirement for software-defined network (SDN) changes.

Handling today's "big data" datasets requires massive parallel processing on thousands of servers, all of which need direct connections to each other. The rise of huge datasets is fueling a constant demand for additional network capacity in interconnected data centers. Operators then face the task of instantly scaling a network to a previously unimaginable size, maintaining any-to-any connectivity amid increased demands for improved uptime and faster responses.

The Open Networking Foundation (ONF), through SDN, is transforming networking architecture by relocating switching and routing functions from hardware to software in five ways. First is to centralize management and control of networking devices from multiple vendors into network control centers. Second is to improve automation and management of applications by using common application programming interfaces (APIs) to virtualize the underlying networking details. Third is to deliver new network capabilities without the need to reconfigure individual devices or to wait for vendor releases. Fourth is to program applications using common programming environments. And the fifth is to increase network reliability and security as a result of centralized and automated management of network devices, as well as applying uniform policies and operating with fewer errors.

Networking technologies so far have operated with a discrete set of protocols designed to connect individual servers through routers and switches over short distances, link speeds and topologies. That will have to change. The static nature of the old networks stands in stark contrast to the dynamic nature of the SDN environment. Applications will be distributed across multiple virtual machines, which directly exchange traffic flows with each other. Traffic will migrate to optimize and to rebalance workloads continually, causing the physical endpoints of existing flows to change. Such migration challenges traditional networking, from addressing schemes and namespaces designation to a change that is based on software design.

Paul A. Strassmann is the distinguished professor of information sciences at George Mason University. The views expressed are his own and not necessarily those of SIGNAL *Magazine.*

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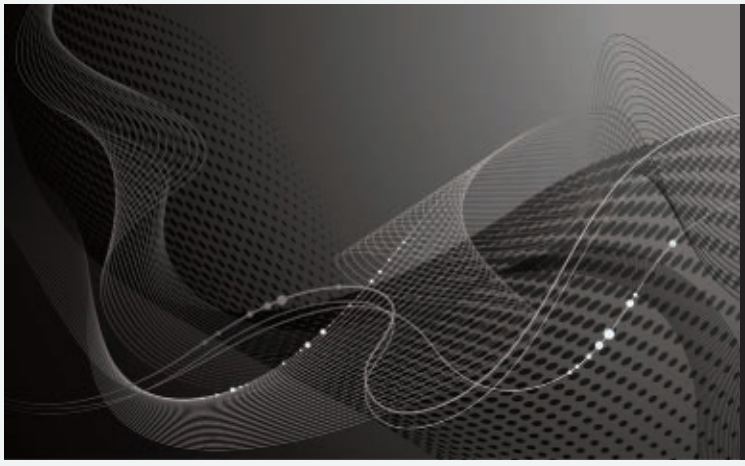

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