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Eye on Innovation

Government and Defense Edition: SGI News

Information Superiority

The Value of Rapid Decision Making in Military Environments

By Arthur L. Money and Glenn Ignazio

Decision making used to be a linear process: observe, estimate, develop courses of action, simulate the action, decide on the course, produce the orders, and so on. Now decision making is dramatically different, for at each level commanders will have near-real-time, simultaneous access to the current common picture. This situation then enables:

1. Exchange of ideas among planners/commanders at all levels = collaboration 2. Integration of operational and intelligence information = integration 3. Rapid gaming of courses of action = simulation 4. Rapid issuance of orders = rapid command and control

Collaboration, integration, simulation, and rapid command and control shorten the decision-making cycle and increase the effectiveness of a leader's decision. Time becomes the measurement of success. Napoleon Bonaparte once wrote: "You can ask me for anything you like, except time." Time is the only variable that can't be compressed. However, compressing the cycle of data to information, information to knowledge, and knowledge into power can be accomplished. The advent of supercomputing and visualization of complex data sets is the solution and allows for the old serial process to be replaced by parallel processes—thus gaining the effect of time compression.

The concept of information superiority is not new, but only now is it truly possible. This is due to persistent intelligence gathering, increased communication bandwidth, interoperability, adaptability, and high-performance computing, all translating multiple sources of data into usable information.

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"Collaboration, integration, simulation, and rapid command and control shorten the decision-making cycle and increase the effectiveness of a leader's decision."

— Arthur L. Money, Former Assistant Secretary of Defense

IN THIS EDITION

Global Defense Solutions

By Glenn Ignazio

We are seeing a transformation in technology. In operations, employment, and development we are observing a global trend in collaboration. Collaboration is the new buzzword, especially in complex solutions. We have been listening to our customers, the market, and our sales force to evolve our solutions architecture to be collaborative. What does this mean and what opportunities does this uncover? Let's take a specific solution approach.

First, let's look at operations. I will use flight simulation as a great example. Flight crews all over the world now have the opportunity to create their routes and then fly the actual routes in a simulator. This simulation/mission rehearsal gives the aircrews the opportunity to experience their combat missions before ever stepping into the jet. In today's battlefield environment, we see that coalition forces make up a majority of the military campaigns around the world. If you are planning and rehearsing for a mission, what happens when the other "players" are not collocated with you? How do you rehearse a mission using multiple platforms across geographically separated areas? SGI, in conjunction with our partners, has run collaborative simulations and mission rehearsals for years. When aircrews are flying in formation with dissimilar aircraft for an actual mission rehearsal, the other aircraft are not computer driven, they are actually being flown by aircrews miles away, flying their simulators together for a force employment and engagement rehearsal. This is a true example of collaborative operations.

Second, we'll look at employment. SGI® Decision Support Center and command-and-control solutions have been critical for operations in civilian, military, and intelligence applications. Multiple command centers require collaborative systems to jointly run operations across commands, theaters, and countries. The key attributes or critical factors that SGI brings to the table are sensor fusion and collaborative command and control. This is the ability to fuse multiple sensors/sources together for a common operating picture and then share that information with other command centers and distribute it to field assets when required. A Command Center example would be an air operations center working collaboratively with naval combat information centers for effective joint-force employment. A field asset example would be special operations, small naval craft or forward-deployed troops connected to command-and-control centers for effective execution of operations and immediate battle damage assessments. Imagine a small naval PT boat with the power of an aircraft carrier's combat information center. That is power. That is collaboration. That is innovation.

Lastly, let's focus on development. When discussing development of new advanced military systems, we touch on more than one solution. At first, it may be a manufacturing solution for a missile design, requiring detailed mechanical and electrical plans. After the initial development, one must consider the mathematical computation for the aerodynamic flight effects (high-performance computing). Then, one must look at how the missile system will be utilized in the field. Simulation to create force employment techniques, evaluation, and flyout scenarios must also be considered. Finally, command-and-control systems must be able to actively use this system in a combat environment. In each of these sequences, we have taken multiple solutions and brought them together to solve a customer's problem. Let's not forget that every step just discussed can be developed, rehearsed, and executed collaboratively, especially when all resources are not in one location.

To summarize, defense, government, and intelligence applications will not operate in a silo or stovepipe anymore. The systems and applications must be able to share securely both internally and externally to the organization. We are combining collaborative simulation, mission rehearsal, geospatial and intelligence, command-and-control, and homeland security solutions with security platforms such as the Trusted IRIX™ system software and distribution methods such as the OpenGL Vizserver™ computing solution to solve your problems. We have been and will continue to be at the forefront of this change to network-centric warfare and have been sharing the solutions with our customers from Asia to Europe and across North America.

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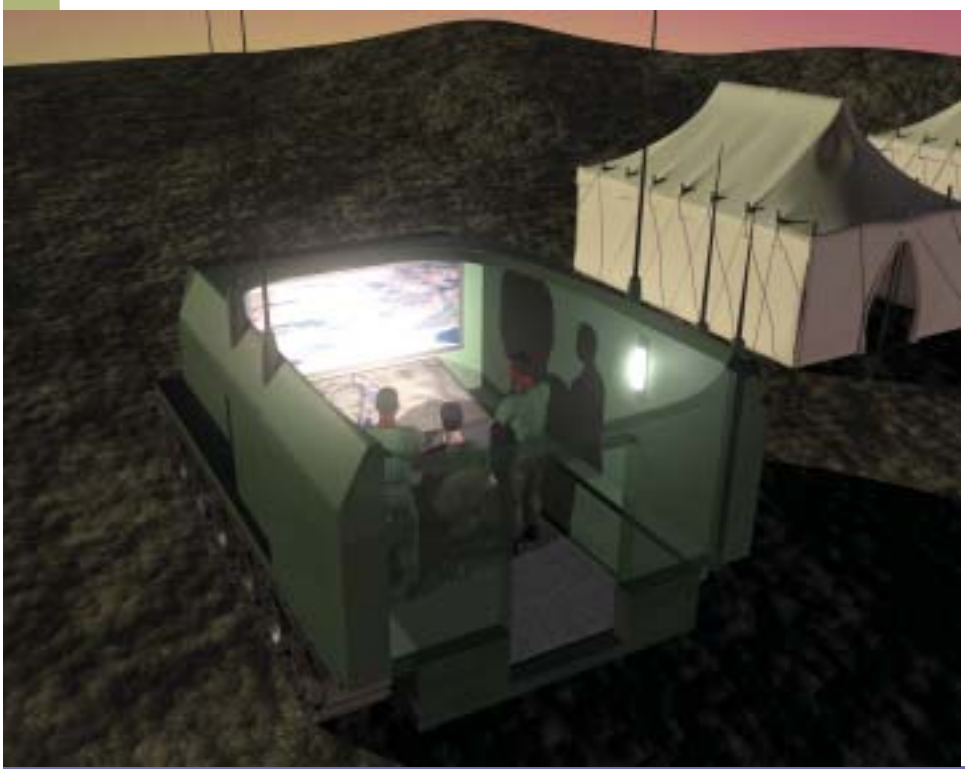
The rapid conversion of data to information is complex. However if you can visualize the data and make the information intuitive, the individual can utilize his or her cognitive skills for decision making rather than for understanding where the data is coming from and going to. Visualization of information—the cognitive conversion of information to knowledge—enables rapid decision making and is the power of information superiority.

So how is this conversion possible? It involves data collected from a massive array of sensors or sources. These inputs are temporal, spectral, and spatial and represent persistent observation. When the data from these multiple inputs are integrated, the resulting output can be exponentially more significant than the result obtained from any single piece of data and, when properly represented, translate to valuable information—thus the management of complex data sets. This information must be visualized and distributed to whoever needs it—especially to those who are making decisions based on the knowledge obtained from this critical information.



An interesting characteristic of information is its ability to exist in multiple locations simultaneously. Hence the right people really can have the right information at the right time. Fast, reliable exchange of information is now a common, everyday event. Each commander or executive has the ability to see and hear virtually everything he or she needs to in any engagement.

While battles, wars, and covert operations are fought with weapons of the trade, these engagements can only be won with information and decision superiority.

The revolution of military affairs includes four tenets: mobility, stealth, precision, and information superiority (the last of which includes information protection). All of these tenets are based on products and solutions created in an industry that utilizes high-performance computing, management of complex data sets, and real-time visualization in design, development, and operations.

For example, the military is moving toward a network-centric approach—a network-enabled approach—linking ground forces, ships, aircraft, and satellites to create a rich, shared, common picture of the battle space in motion. This linkage is an interactive, multiple-player, dynamic environment and is possible due to advances in high-performance computing as well as the ability to display information in real time. The latest SGI® products make this concept reality—handling both structured and unstructured data such as imagery or geospatial data and text.

In summary, the "fog of war" must be effectively lifted, thereby clearing up the uncertainty that exists in such conflicts. Getting the information (knowledge) and operationally executing decisions before the adversary is what information superiority is all about. Information superiority is like a sharpened sword on the battlefield. Take heed of the following quote from Sun Tzu, which epitomizes the importance and value of intelligence and information, of both your assets and your adversary's:

"Know the enemy and know yourself; in a hundred battles you will never be in peril. If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril."

Saab's Gripen:

Creating the World's First All-Digital Combat Aircraft

When creating a high-technology aircraft designed to secure a nation's borders, one needs to have a budget sufficient to do the job. Yet, before Saab Aerospace could begin development of the supersonic Gripen, the world's first fourth-generation combat aircraft, it received a serious fiscal challenge from the Swedish government.

When the Gripen project began, production and development costs were rising exponentially. One of the Swedish government's conditions for ordering a new Swedish fighter was that this trend be broken. The Gripen has met or surpassed all the original requirements in this respect. It also has significantly lower life-cycle costs than those of older competitor aircraft. With the Gripen,

Saab Aerospace has developed a highly cost-effective defense system to compete on the international market.

As one way of helping reduce expenses while maintaining a wide technological advantage over the competition, Saab is teaming with SGI, amongst other partners, for the tools needed to develop a leading-edge cockpit. Using an advanced flight simulator powered by an SGI® Onyx® family graphics supercomputer with InfiniteReality4™ graphics, Saab is now able to configure, test, and then quickly alter computer-generated virtual controls while a pilot maneuvers the simulator through a highly detailed virtual world rendered in real time. The goal is to create a complete set of instruments that instantaneously gives the pilot the information he needs and then allows him to set his course of action without delay.

The Gripen system is Saab Aerospace's most important product and the first fourth-generation combat aircraft in operational service. Gripen is designed to meet the demands of all current and future threats, while at the same time meeting strict peacetime requirements for flight safety, reliability, training efficiency, and low operating costs. Earlier-generation aircraft were individually designed for air-to-air, air-to-ground, or reconnaissance roles. But the Gripen is built around a completely digital infrastructure, meaning that it is not only multirole—able to perform all three types of missions—it is also swing-role. Simply by pressing a few buttons, the pilot can reconfigure the Gripen's systems in flight for it to be able to operate in more than one role during the same mission.

This digital infrastructure also means that the Gripen system can be continuously updated and developed. The possibility of cost-effectively incorporating upgrades means that the aircraft can always be kept modern to cope with emerging threats and new customer requirements.

With an all-digital cockpit, pilots control systems with their hands on the throttle and stick, as well as with buttons around the head-down displays. Data can also be combined from multiple sources, such as another aircraft or ground reconnaissance, and then shown simultaneously on a single display. In addition, the pilot has both a traditional wide-angle head-up display and a helmet-mounted display, which shows a variety of symbology indicating the presence of visual objects. The pilot not only sees the icons but simultaneously looks through them at the visual terrain.

The SGI Onyx family visualization system powers the VAPS software suite from Montreal's Engenuity Technologies. With VAPS, Saab Aerospace can test the human-machine interface of head-down and head-up displays by creating virtual control panels in its flight

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simulator and various pictogram designs in its head-mounted helmet display, both of which can then be changed at will. The SGI Onyx family visualization system is also used to create the simulated external environments, highly detailed aerial views of the surrounding countryside that are virtually indistinguishable from the real world and generated in real time. By "flying" through this simulated environment, pilots test the efficacy of both displays.

"We've been using SGI graphics supercomputers since 1996 to help us create both display simulation and exterior image generation," noted Andreas Ladell, Saab Aerospace systems engineer. Ladell considered other companies' solutions to replace his existing hardware, but chose SGI. "Not only was SGI technology priced appropriately, but with other suppliers, we would have been forced to use a closed system. Using SGI's open IRIX operating environment, we were able to do our own software development and create just the right tools for the job.

"Thanks to the 1Gbyte of dedicated 3D texture memory in our new Onyx system, we'll be able to create a real-time, fully textured environment and increase our resolution from two to less than one meter over large areas," Ladell said. "That's important to enable simulation of flight at very low altitude of 100 feet, an essential capability of the Gripen."

Saab test pilots will soon be working in flight simulators, powered by SGI® technology, that offer highly detailed, real-time images of the terrain around the Saab Aerospace factory, as well as the surrounding countryside and even large parts of Sweden. The images are generated using software mapping and database tools developed by Saab, which run on the Onyx family system. "With the new SGI solution, we're limited only by the amount of mapping data we can acquire, but not by our ability to process it," Ladell said.

Saab Aerospace has delivered 120 Gripen aircraft to the Swedish Defence Materiel Administration (Försvarets Materielverk), and others have been purchased by the governments of Hungary and South Africa. Gripen has also been selected to meet the national, NATO, and European defense needs of the Czech Republic. Yet the work doesn't stop. With its digital infrastructure, the Gripen system will be continuously updated and developed, reducing the life-cycle costs as compared with those of older competitor aircraft.

"As new weapons and new sensors are developed, we'll be able to integrate them into the next generation of the aircraft and create the new control panels to operate them, quickly and economically," said Ladell. "SGI technology, as well as innovations from our other partners, has definitely given us a leg up over the competition."

Eye on Innovation

Creating a New Air Defense System for the 21st Century

In the world of the 21st century, knowledge will triumph. To defeat the enemy, not only must the U.S. armed services excel at gathering information, they must also be able to rapidly analyze it, understand it, and use it dynamically. Quickness of action will be key to gaining a strategic advantage against a growing number of potential foes and rapidly changing world situations.

The problem, in short, is not getting information so much as managing it, a fact that was clearly brought home by the tragic events of September 11, 2001. The sudden nature of the attacks and the continually changing events in their wake substantiated the need to rapidly deploy an air defense system that not only can respond to changing conditions but also quickly anticipate possible scenarios and develop plans of action.

"We're witnessing a revolution in the technology of war. Power is increasingly defined not by size, but by mobility and swiftness. Advantage increasingly comes from information such as the three-dimensional images of simulated battle that I have just seen."

—President
George W. Bush

"The grave threat from nuclear, biological, and chemical weapons has not gone away with the Cold War," President George W. Bush presciently noted in February 2001. "It has evolved into many separate threats, some of them harder to see and harder to answer. And the adversaries seeking these tools of terror are less predictable, more diverse."

In 1998, in conjunction with the Johns Hopkins Applied Physics Laboratory, the U.S. Navy began to develop a prototype Area Air Defense Commander (AADC) Capability program to address existing and emerging ballistic and air-breathing threats.

The Area Air Defense Commander is responsible for planning, executing, and coordinating air and missile defense operations in an integrated air-defense environment, theater-wide. The AADC Capability is a battlespace management system designed to improve the AADC's battlefield readiness by rapidly analyzing the capabilities and intentions of enemy ballistic missile and air forces, comparing them with allied assets in the theater, and simultaneously creating "what-if" scenarios to facilitate the rapid development of robust air defense plans.

The system is designed to display a three-dimensional, graphically rich battlespace, with clearly discernable friendly air defense assets and enemy ballistic missiles, land attack weapons, and air fighters. Commanders can use the AADC system to visualize the theater and develop a dynamic set of integrated air defense plans in support of the goals of the Joint Force Commander.

The objective is to radically improve battlefield response times. Before the development of the AADC program, Navy analysts digested incoming intelligence data and created attack scenarios using little more than "a stack of publications the size of a pickup truck, a bunch of acetate, and some pencils," noted Captain Ken Hamilton, U.S. Navy Reserve. "They'd be wading through this data for days or possibly weeks to come up with a plan."

With the AADC system, "we can create more air defense plans and evaluate how effective they are in a substantially faster time frame," added Mike Tweed-Kent, vice president and general manager of General Dynamics Command and Control System Business. Plans can be created in minutes and then distributed to the combined units that are charged with carrying out the mission of theater air and missile defense.

In July 2000, the Navy awarded GDAIS a contract to produce an AADC Capability Engineering Development Model. However, positive fleet input and the immediate requirement to address threats to U.S. forces and homeland defense led the Navy to decide to rapidly field the AADC prototype system already developed by JHU Applied Physics Lab. As a result, General Dynamics had to rapidly make a transition from a prototype to a production system and deploy it on an accelerated basis.

With the AADC Capability system, information regarding the enemy's assets, the constraints of its weaponry,

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and likely courses of action are continuously analyzed and paired against the capabilities of friendly forces. This ability to rapidly assess the operational situation at the theater level allows the AADC to quickly develop and direct the execution of effective air defense plans. Developing only one attack plan would not be enough. Instead, the system must be dynamic and predictive, ready to alter scenarios at any time to respond to new and changing enemy courses of action. The AADC Capability system allows commanders to monitor the action in real time, using wide-screen, high-definition displays—supplied by SGI—that show the battlespace three-dimensionally. Personnel can quickly engage in real-time fly-throughs over and around battlefield assets to examine the space from any angle. Both the planning and the current operations displays can be viewed simultaneously, giving commanders the ability to alter a friendly force air defense laydown and then quickly assess the operational effect of that change.

The AADC system is powered by a wide range of SGI computing and visualization products. Each installation includes a 32-processor SGI® Origin® 3400 server, four SGI® Onyx® 3200 visualization systems (including one for system redundancy), eight Silicon Graphics® Octane2™ visualization workstations, and one Silicon Graphics® O2+™ graphics workstation. In addition to the display technology, built-in videoconferencing and e-mail capabilities mean that other commanders can quickly be brought into the operation. "The key is collaborative planning," noted Rear Admiral Philip M. Balisle, then commander of Cruiser-Destroyer Group Three. With AADC, "the land, air, and maritime component commanders can all be collaboratively working to develop plans and execute an air war in real time."

Unlike other systems, SGI AADC technology displays objects in the theater as they really are. The use of visual representations greatly enhances situational awareness, an especially critical factor during an engagement, when participants are under extraordinary stress and time constraints. Realistic, color-coded icons are universally recognizable, allowing for rapid grasp of the operational situation.

Using SGI displays and large 30x30-foot "reality screens," planes look like planes, and friendly aircraft can easily be distinguished from the enemy. "I see an F-14 as an F-14," noted Captain Hamilton. "With AADC, I see the engagements occurring. The system presents me with a schedule of engagements that I can execute or not in a complex battlespace. AADC helps me zone in on critical contacts to understand what our force is doing to combat that threat."

The AADC technology was initially tested in 1998 during Fleet Battle Experiment Charlie and in the Theater Missile Defense Initiative. Thanks to the new system, participants had more time to spend developing battlefield analysis and needed less time to organize and assemble incoming data, according to Commander Michael Delaney, former fleet liaison and evaluation officer in the AADC Capability Program Office.

The system was used as part of a full-scale, multinational fleet exercise during RIMPAC 2000. Conducted off the Hawaiian coast, the AADC Capability was installed in USS Shiloh, which was acting as the antiair warfare commander for the USS Abraham Lincoln carrier battle group. According to Rear Admiral Balisle, the AADC system "showed outstanding value as a force enabler that will allow a ... battle group commander to enter a troubled area and gain control of it quickly." As one reservist participating in the exercise noted, "The AADC Capability prototype is a dream. Situational awareness was significantly enhanced by (its three-dimensional graphics and screen icons)."

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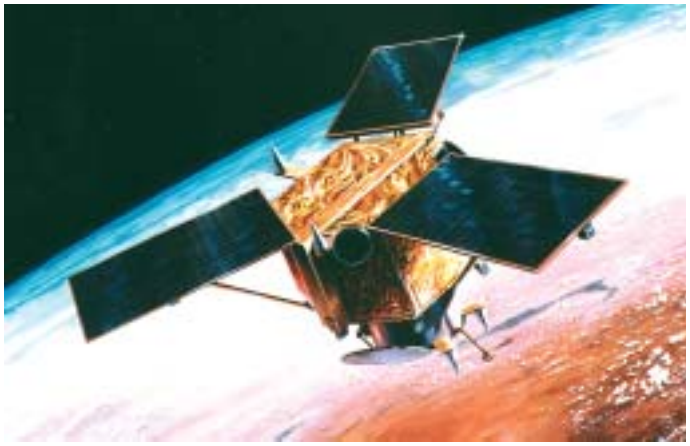
Eye in the Sky

SGI Helps Space Imaging Bring One-Meter Resolution Satellite Imagery to the Commercial Marketplace

Space Imaging, headquartered in Denver, Colorado, is a leading supplier of visual information products and related services derived from space imagery and aerial photography. The company collects earth imagery from its own IKONOS satellite and Digital Airborne Imaging System (DAIS-1™) and those of other satellite agencies, then processes the data and archives the imagery before making it available globally via the Internet and other first satellite to provide unclassified one-meter resolution imagery for commercial use—firmly established the company as a global leader in providing high-resolution satellite imagery.



Space Imaging utilizes SGI high-performance computing (HPC) servers within its ground stations around the world to provide real-time image processing for its IKONOS one-meter high-resolution imagery. Space Imaging chose SGI systems because they provide cost-effective supercomputer bandwidth, throughput, and processing power.

According to John Copple, chairman and CEO of Space Imaging, "We have been able to lower the cost per unit of what we produce and make it feasible to bring high-resolution data to the commercial marketplace using commercial off-the-shelf computer technology available from SGI."

Geospatial Marketplace

Space Imaging's products, services, and solutions serve a wide variety of markets throughout commercial, government, and consumer sectors, a market estimated to be worth $2.5 billion by 2003. Among the sectors on which both Space Imaging and SGI focus are:

- Environment: Impact assessments, regulatory compliance studies
- Exploration: Oil and gas exploration and monitoring
- Government: Local and regional planning, mapping, urban monitoring, change detection
- Infrastructure: Transportation network assessments, site planning and development studies
- National emergencies: Natural disaster assessments, emergency evacuation studies
- Security: National and global security, airports and harbors
- Telecommunications: Cell siting studies, network assessments, corridor planning
- Media: Reporting, entertainment

To sum up the team approach to serving these markets, Anthony Robbins, senior vice president of SGI, said, "The SGI and Space Imaging team will provide best-in-class solutions to help commercial and government customers in the geospatial market solve some of the world's biggest data problems."

Collecting Geospatial Data

The IKONOS satellite can collect and process some 900 to 1,000 images per day and can revisit any location on earth every three days at high resolution. The satellite collects one-meter resolution black-and-white (panchromatic) images and four-meter resolution color (multispectral) images simultaneously. IKONOS performs these amazing tasks from an orbit 423 miles above the earth, moving at 17,500 miles per hour. The IKONOS satellite can easily distinguish objects on the earth's surface such as cars and trucks, roads, pipelines, individual trees, houses, large equipment, boats, ships, and airplanes.

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In addition to the IKONOS satellite, Space Imaging also uses its company-owned DAIS-1 to collect aerial imagery. Other satellites contracted to provide earth imagery include the two Indian Remote Sensing satellites, the U.S. LandSat, and Canadian RADARSAT.

Ground Stations: Staging, Processing, and Storing Imagery Data

Space Imaging utilizes multiple satellite systems to facilitate an efficient, global collection program that ensures customers are provided the best, most efficient service possible. The satellite imagery is transmitted to Space Imaging's ground stations along with those of its regional affiliates located in the U.S., Japan, South Korea, Turkey, Singapore, and the United Arab Emirates. Robbins points out that, "What makes IKONOS unique is that it is the only satellite that enables its worldwide ground station customers to directly task the satellite, receive the imagery data in real time, and process and store the imagery data locally."

In a typical ground station, Space Imaging and its partner Raytheon integrate four SGI® Origin® 300 servers of various processor and memory configurations for the data capture server, compute server, database server, and media server. The companies also deploy five to 10 SGI visual workstations and a 3TB to 5TB SGI® TP9400 RAID storage system to optimize satellite ground station processing, archiving, production, data analysis, and quality control functions.

The company selected SGI® Origin® family systems because of their ability to provide real-time image processing of one-meter high-resolution imagery data relayed to ground stations by IKONOS. SGI systems provide the bandwidth, throughput, and processing power to combine imagery data from IKONOS with other geospatial data to produce 3D data sets of the world that can be navigated in real time. This combination of SGI hardware and Space Imaging data is ideal for the visual simulation industry.

Analyzing the Data

In addition to the visual simulation market, Space Imaging's CARTERRA™ Analyst software integrates geographic information systems (GIS), remote sensing, imagery analysis, photogrammetry, and cartography tools and data from a database, perform multispectral analysis, create and combine image files, generate reports and products, and create GIS databases of

Venice, Italy, including the Railway Station, the Grand Canal, and St. Mark's Square

Invesco Field and Mile High Stadium, Denver, Colorado

reports, data layers, and images. Space Imaging and SGI are providing customers of CARTERRA Analyst the option of using the SGI® File Server 830 system, using SCSI JBOD technology, or the SGI® File Server 850 system, using 2Gb RAID 5 technology.

A Relationship for the Future

"This relationship with SGI demonstrates our commitment to working with premier technology providers who offer leading-edge solutions to the geospatial community," says Copple. "SGI is the only provider of high-performance computing systems powerful enough to provide mission-critical ground station image processing to the commercial, high-resolution satellite imaging market."

SGI and Space Imaging signed a teaming agreement to further expand cooperation and revenue opportunities in the geospatial marketplace. A joint strategic opportunity committee (JSOC) was formed to help determine mutual revenue goals and create mutual business opportunities from which SGI and Space Imaging can develop new solutions and generate incremental revenue. The committee, which meets quarterly, will also help Space Imaging develop enhanced solutions that allow it to capture nontraditional revenue from the use of its Regional Operations Center ground stations.

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Air Defense System

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The program has been well received by Navy personnel. "AADC provides an accurate, three-dimensional air picture and a revolutionary campaign-planning capability that reduces planning time from days to hours or minutes," noted Vice Admiral Michael G. Mullen, then commander of the Second Fleet, in a February 2001 demonstration to President Bush. "It is, quite simply, the most advanced air-defense planning and display system of its kind anywhere in the world."

"The AADC module is exceptionally well conceived, designed, and built," agreed the Commander of the Sixth Fleet. "It offers a revolutionary capability to air-defense commanders challenged with command and control of increasingly advanced and interoperable forces."

Rodney Sams, of General Dynamics Advanced Information Systems, noted "To use all the new capabilities on the next battlefield that have been bought and paid for, our warriors must have a coherent, believable depiction of the battlespace. All of us, including our allies, will need to use the same game book. Collaborative, near-real-time planning and tactical operations will be essential."

It is a viewpoint with which the President of the United States would agree. After seeing a demonstration of the AADC project, President Bush pointed out that "We're witnessing a revolution in the technology of war. Power is increasingly defined not by size, but by mobility and swiftness. Advantage increasingly comes from information such as the three-dimensional images of simulated battle that I have just seen. Safety is gained in stealth and forces projected on the long arc of precision-guided weapons. The best way to keep the peace is to redefine war on our terms." With AADC, the U.S. Navy and its commercial partners have taken one large step toward that goal.

Space Imaging

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Jeff Young, vice president of Global Solutions, Sales, and Marketing at Space Imaging and a member of the JSOC, points out that, "SGI is an important contributor to our deliveries to [Space Imaging's] Regional Operations Center (ROC) affiliates. It behooves us to have a strong working relationship with SGI because of the high-performance computing capacity of SGI platforms and Space Imaging's need to process and store huge volumes of the satellite imagery data. As we move from one-meter imaging solutions to half-meter imaging solutions, we expect to at least quadruple the volume of data required to cover the same geography. This will enable us to grow our existing ROC business as well as identify new growth opportunities. For Space Imaging to realize our expected growth potential in the near and long term, the data processing capabilities of SGI high-performance computers are critical to that growth."

As the demand for high-resolution satellite imagery continues to increase in the months and years ahead, SGI will continue working closely with industry leaders such as Space Imaging and Raytheon to provide the bandwidth, throughput, and processing power necessary to advance the ability of existing and future ground stations to receive and process imagery data from next-generation satellites.

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