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WELCOME TO THE NEW DACS!

By Paul M. Engelhart, DACS Contracting Officer’s Representative (COR)
Air Force Research Laboratory - Rome Research Site

Just a few short months ago on July 1st, the new Data and Analysis Center for Software (DACS) contract was awarded to Quanterion Solutions Incorporated, marking the beginning of a new era within the Defense Technical Information Center (DTIC) Information Analysis Center (IAC) program as the first Basic Center Operation (BCO) contract, specifically as a small business set-aside acquisition. Chartered as one of ten IAC’s administered by DTIC, the DACS continues to be a valuable resource for accessing scientific and technical information gathered from a number of resources to solve new and emerging challenges.

Please be assured that the mission of the DACS has not changed with the recent award of the DACS BCO contract. The DACS technical area of focus remains to be software technology and software engineering in its broadest sense, where the DACS serves as a central distribution hub for software technology information sources. Designated as the DoD Software Information Clearinghouse, specifically aimed to serve as an authoritative source for state-of-the-art software information providing technical support for the software community, the DACS offers a wide variety of technical services and supports the development, testing, validation, and transition of software engineering technology to the defense community, industry, and academia. DACS subject areas encompass the entire software life cycle and include software engineering methods, practices, tools, standards, and acquisition management. Also included are programming environments and language techniques, software failures, test methodologies, software quality metrics and measurements, software reliability, software safety, cost estimation and modeling, standards and guides for software development and maintenance, and software technology for research, development, and training.

The DACS was originally formulated at the Rome Air Development Center (RADC), the predecessor to the Air Force Research Laboratory – Rome Research Site, as a pilot study back in 1975 followed by the first DACS contract in 1978 and the designation as an IAC in 1981. Since that first DACS contract, there have been six very successful follow-on contracts preceding the award of the new DACS BCO contract on July 1st. I have personally had the privilege to serve as the DACS COR since 1993 on the two previous contracts and will continue in that role on the new contract. The DACS has an incredible history and numerous accomplishments over the past three decades with a very bright future ahead. I’ve been very fortunate to have been intimately involved with the DACS program over the past 17 years and am truly excited to continue in my role as the DACS COR into the next era.

I would personally and publically like to thank the team at ITT once again for all of their hard work and perseverance throughout the 30-day transition period during the month of July in helping Quanterion Solutions stand up the new DACS, which was totally transparent to the DACS user community. Their commitment to detail and quality is second to none. Many thanks to Vic Choo, Ellen Walker, Phil King, Jim Burke, Rob Vienneau, Dan Ferens, Elaine Fedchak, Jodi O’Hara and the rest of the team for their very commendable efforts. ITT was extremely instrumental in both evolving and expanding the DACS over the past 22 years in operating the DACS, especially with the emergence of the internet in the mid 1990’s, and has built a very solid foundation for the continued success of the program. The DACS has always been able to stay on the leading edge of software technology for their user community, which will continue into the future.

This special edition of Software Tech News highlights the changes to the IAC program that have evolved over the past few years, particularly in regards to the new acquisition process, as well as the capabilities of the new DACS team. We welcome Quanterion Solutions as the new DACS prime contractor, who have been charged to manage and operate the DACS as well as to continue to serve as a centralized source for data and information concerning software engineering and software technology. Quanterion personnel have been involved in the IAC program since 1986 and possess a wealth of knowledge and experience, which will be portrayed further within this issue. Team members include Allen Corporation, Syracuse University, the University of Southern California (USC), and the State University of New York Institute of Technology (SUNY IT) where the DACS is located in Utica, NY.

As we boldly forge ahead with the new DACS, please feel free to contact us with any feedback, concerns, and/or questions. The DACS is here to help you!

About the Author

Paul M. Engelhart is a Senior Computer Engineer at the Air Force Research Laboratory/ Information Directorate – Rome Research Site. He has over 29 years of experience in the software engineering field, including 17 years as the DACS COR. Mr. Engelhart holds a BS degree in Mathematics and Computer Science from the State University of New York at Cortland and a MS degree in System and Information Sciences from Syracuse University.

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The current world situation is placing new strains on our combat forces, our weapon systems, and the supporting infrastructure. These strains are placing an increasing emphasis on rapid response for the science and technology community to solve new issues as they arise. With a potential downturn in spending for new equipment, reuse of information makes sense and we expect the demand for innovative approaches to using and improving existing technology to increase.

Enter the Defense Technical Information Center (DTIC) and the Information Analysis Center (IAC) Program.

DTIC is responsible for collecting all scientific and technical reports for the Department of Defense (DoD) and is the Program Management Office (PMO) for various IACs established in accordance with DoD Instruction 3200.14. Today there are 10 DTIC-sponsored IACs focused in the following functional areas:

- Advanced Materials, Manufacturing, and Testing Information Analysis Center (AMMTIAC)
- Chemical, Biological, Radiological, Nuclear Defense Information Analysis Center (CBRNIAC)
- Chemical Propulsion Information Analysis Center (CPIAC)
- Data and Analysis Center for Software (DACS)
- Information Assurance Technology Analysis Center (IATAC)
- Modeling & Simulation Information Analysis Center (MSIAC)
- Reliability Information Analysis Center (RIAC)
- Military Sensing Information Analysis Center (SENSIAC)
- Survivability/Vulnerability Information Analysis Center (SURVIAC)
- Weapons Systems Technology Information Analysis Center (WSTIAC).

Each IAC has the mission to collect, analyze, evaluate, synthesize, store, publish, disseminate, and provide research, development, test, and evaluation (RDT&E) functionality concerning available worldwide scientific and technical information (STI) and engineering data. This function is known as the Core or Basic Center Operations (BCO) of the IAC. STI is obtained from a variety of electronic, paper, or other media sources and serves as a bridge across government, industry, and academia. Additionally, each IAC leverages Core knowledge to perform additional work (known as “technical area tasks” (TATs)) to verify and validate the technical accuracy/reliability of
existing data; evaluate and generate data collection and analysis techniques reported in literature; develop alternative approaches to collection and/or analysis related to their assigned technical area; identify and/or fill voids in existing data or knowledge base specific to user requirements; and advance the standardization of their functional area. TATs are actually task/delivery orders (i.e., mini contracts) within the overall IAC contract. They are deliverable-based contracts, where the products are STI-focused and are made available for reuse by all authorized government, industry, and academic personnel through input into the Total Electronic Migration System (TEMS). TEMS provides instant access to the full online collection of IAC STI using easy-to-use tools to simplify searches by providing full text, abstracts, and bibliographies that further expand the researcher’s world of knowledge (https://tems-iac.dtic.mil).

The Future

As a result of changes required by the FY08 National Defense Authorization Act (NDAA), a new acquisition/contracting strategy was required for the entire IAC Program. The current 10-year, single award IAC contracts needed to be changed due to limitations being placed on single award contracts and the need to enhance competition on task/delivery orders in excess of $5M. The resultant construct shows separate contracts for the TATs and the BCO.

Figure 2 provides a comparison of the current and future constructs. The way ahead section of this figure shows each IAC BCO will be a single award contract to provide information collection (including obtaining information from open sources, conferences/symposiums, and other media), information management and internal information processing (including maintaining various libraries, interface with TEMS, and maintaining a subject matter expert (SME) network), information analysis (including maintenance of existing and development of new analytic tools and techniques and synthesis of information from defense sources resulting in new knowledge), and information dissemination (including response to technical (user) inquiries, maintaining an awareness program (newsletter, web site, etc.), and maintaining relevant models, software, and databases).
A NEW ERA FOR THE IAC PROGRAM AND DACS (CONT.)

In July 2010 the DACS BCO contract was awarded to Quanterion Solutions, Inc. in Utica, NY. Key DACS services of information collection, analysis, and dissemination will remain unchanged, providing a continuity of service important to the user community. The DACS website will continue at https://www.thedacs.com.

Three multiple-award, indefinite delivery, indefinite quantity (IDIQ) sets of contracts are being awarded to perform contract work (TATs). The first of these was just awarded in May 2010 and covers Software, Networks, Information, and Modeling & Simulation (SNIM). It combines the TAT effort associated with the technologies of the DACS, IATAC, and MSIAC. With a maximum value of $2 billion over the next 5 years, SNIM serves as an efficient contracting vehicle to quickly get information assurance, software data and analysis, modeling and simulation, knowledge management and information sharing services into the hands of DoD components, other Government agencies, industry and academia. For more information on SNIM, visit the IAC Program Web site at http://iac.dtic.mil/.

In spite of the separation in IAC contracts, the mission of the DACs remains the same (figure 3). The IAC PMO has worked extensively with our partners in government, industry, and academia to design a new construct that carries forward the integration of BCO and TAT functions. Core IAC Operations (BCO) depend on STI generated by customer-funded projects (TATs), and vice versa. What sets the IAC Program apart is the focus on investing up front in developing a comprehensive knowledge base (IAC BCO), then leveraging that knowledge base to expeditiously and effectively solve specific challenges requiring research and technical analysis. While operating under separate contracts, BCO and TAT contractors are integrated under a unified approach built on information sharing, and focused on building the technical community across government, industry, and academia.

About the Author

Terry M. Heston is the Program Manager of the DoD Information Analysis Centers (IACs) at the Defense Technical Information Center (DTIC), where he has served in various management roles over the past 17 years. In his current position, Mr. Heston works closely with the Office of the Director, Defense Research and Engineering to ensure the IACs are positioned to best meet the research and analysis needs of the DoD both today and in preparing for an uncertain future.
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Introducing Quanterion Solutions
by Preston MacDiarmid, President Quanterion Solutions Incorporated

Quanterion is extremely proud to be the first company competitively selected to operate a “Basic Center Operations (BCO)” contract under the Department of Defense (DoD) Information Analysis Center (IAC) program. The award clearly acknowledges the company’s growth in terms of technical breadth since its beginning in 2000.

Quanterion Solutions Incorporated was formed in 2000 as a small business to perform services for government and industry using QUANTitative critERION for decision-making, hence the name Quanterion. The company of four has grown to more than forty in ten years, rapidly expanding its technical services and customer base. While its beginning focused on services in reliability, maintainability and quality, it has since grown to address materials engineering, software engineering/development and information assurance/cyber security. Its software products include desktop engineering analysis tools as well as asynchronous on-line training courses.

Quanterion is by no means new to the DoD IAC program with experience dating back to 1986 when I served as the Contracting Officer’s Technical Representative (COTR) for a sister center to the DACS, the Reliability Analysis Center (RAC) (now RIAC) while at the Rome Air Development Center (RADC) (now AFRL/Rome). After leaving government service, I later served as RAC Director for ten years at IIT Research Institute (IITRI) (now Alion), followed by several years as Vice President of IAC Operations for five DoD IACs.

The company skills in operating IACs come from a long line of current and past IAC Directors, Deputy Directors and other key personnel with more than 90 cumulative years helping to make the program a success. Past Directors Dave Rose (Advanced Materials, Manufacturing and Testing IAC (AMMTIAC)), Tom McGibbon (DACS) as well as RAC/RIAC’s Dave Nicholls, Dave Mahar and Bill Denson are well known in IAC-circles.

2005 represented the re-entry of the company staff into the IAC program, when a Quanterion assembled team with Wyle Laboratories as the prime was awarded a competitive contract to operate the Reliability Information Analysis Center (RIAC), with the “I” for “information” added to “RAC” to emphasize that the Center is part of the IAC program.

As pointed out in another DACS Software Tech News article, the IAC Program’s contracting strategy has been restructured over the last few years (1) to introduce greater competition for customer-funded tasks and (2) to create more opportunities for small business in the program. As a result, Quanterion was successful in competing as a small business to operate the DACS Basic Center Operations (DACS BCO). Adding the former DACS Director to our staff about a year earlier certainly helped our approach, allowing his 15 years of successful DACS leadership to continue. With the excellent cooperation of the past DACS contractor, ITT, in the transition, Quanterion is now fully operational under the DACS contract.

While the company’s staff has been successful in operating IACs for a long time, the information world has undergone tremendous change. It’s obvious that the IAC operating teams have to continuously change accordingly, continuing to make the right data and information available, in the most effective formats, in a timely manner. We also have the challenge to capture the lessons-learned knowledge of our rapidly aging technical workforce, now in a truly global economy.

We believe that we have effective and innovative plans for our IAC work in the future, but we certainly don’t have all the answers. We welcome your ideas as IAC customers regarding how we can serve you better. What do you need to do your job better? Think in terms of data/information, tools/models, publications/critical technology assessments, and/or training? We have the flexibility in our IAC contracts to be responsive to your needs, so please let us know what they are by contacting:

- Software Engineering Needs: Tom McGibbon, tmcgibbon@quanterion.com
- Reliability, Maintainability, Quality Needs: Dave Nicholls, dnicholls@quanterion.com.
About the Author

Mr. MacDiarmid is the President of Quanterion Solutions Incorporated, a ten-year old reliability engineering and software development consulting company (quanterion.com). Mr. MacDiarmid is also the Technical Director of the DoD Reliability Information Analysis Center (RIAC) (formerly called the Reliability Analysis Center (RAC)). Previous to forming Quanterion, Mr. MacDiarmid was Director of the RAC for ten years and Vice President of Information Analysis Center (IAC) Operations for IIT Research Institute (IITRI). Prior to that, he was Program Manager for System Reliability Research at the Air Force Rome Air Development Center (later Rome Laboratory and now Air Force Research Laboratory/Rome Research Site) and Assistant Chief of the System Reliability and Engineering Division. Mr. MacDiarmid holds a BSME from the University of Buffalo, an MSME from Syracuse University, and an MBA from Rensselaer Polytechnic Institute. He is an ASQ Certified Reliability Engineer, a Senior Member of the IEEE Reliability Society, and a Member of the ASME. He was the Mohawk Valley Engineers Executive Council 2002 Excellence in Engineering Award Winner for his contributions to the field of reliability. Under his leadership, Quanterion Solutions was presented the 2007 Mohawk Valley “Leading Edge” award for the company’s technical work.
Looking Forward
By Thomas McGibbon, DACS Director - Quanterion Solutions Incorporated

We at Quanterion are very excited and honored to have been awarded the DACS program as the first Information Analysis Center (IAC) Basic Center Operation (BCO) operated by a small business, and to continue the long tradition of success the DACS has enjoyed. I have had the distinct pleasure of leading the DACS for 15+ years of its history – helping to transform it into a modern, internet-based IAC. We now have tens of thousands of users accessing the DACS website every month. Awareness within the software engineering community of the DACS and its services and resources has grown extensively in the last 15 years.

Our Operating Philosophy Does Not Change
As Mr. Engelhart mentioned in his article, the mission of the DACS has not changed. Many things about our operating philosophy will stay the same as well, including philosophies surrounding our website, the DACS newsletter, our training program, technical inquiry support, downloading freely available technical reports, and being able to support customer funded work. While the philosophy stays the same, in each case, the service improves as described in the following paragraphs.

Our emphasis on the DACS website (www.thedacs.com) as a primary information dissemination mechanism and provider of quality new content will continue. We will continue to add information to our Research Areas and Gold Practices. We plan to draw upon the expertise of our teammates to harvest new technical content to populate our website and repositories. The ROI Dashboard© on the website will continue to be an important source of free available performance results data from software technical and management improvements and we welcome new, anonymous data to be added to the Dashboard (see the “Call for Data” sidebar).

The high quality Software Tech News that you are now reading will continue. We have an excellent newsletter editorial board that helps us identify topics and authors for each issue. Planned future issues include such topics as Open Source Software, Systems of Systems Engineering (SoSE) Technology, and Web Collaboration Technology Initiatives in the DoD.

The DACS Training Center providing access to web-based technical courses, instructor led courses, and webinars will continue and will be expanded. Through the DACS Online Learning Center, users have access to over 450 classes on programming, web development, and more. Online courses in Java, Oracle, C++, and .Net, to name a few, also are available through the DACS website. Bimonthly free webinars will also continue – previous webinars can be viewed from the DACS Training Center. Additional instructor-led courses are also planned. In all cases, to learn more about DACS training, please visit the DACS website and click on the Training button at the top of the page.

Four Hours of Free Inquiry Support will continue. Through the “Ask the DACS” button on the DACS website, users will be able to put our Subject Matter Experts (SMEs) to work for you – free of charge. This is a very valuable service offered to DACS users.


Customer funded work is still available through the DACS. The DACS contract offers a quick and flexible contract vehicle to put the DACS and its teammates and SMEs to work for you. The DACS scope is very broad, including software engineering, software technology, and information technology. Through the DACS Core Analysis Tasks (CATs), users are able to tap into the broad and deep technical expertise of the DACS team to solve challenging technical problems. Please contact me to learn more about Doing Business with the DACS.

Many New Plans
We also have begun, or are planning, other exciting new initiatives within the DACS based on feedback from you,
our customers. The objective of these initiatives is to further engage our customers and to expand the scientific and technical information within DACS. Some of our planned initiatives include:

In coordination with University of Southern California’s Center for Systems and Software Engineering (USC CSSE), led by Dr. Barry Boehm, we will establish the DACS-USC CSSE Systems and Software Data Center for the collection, analysis and dissemination of empirical cost related data and cost model parameters from actual systems and systems-of-systems (SoS) developments. This repository will also include cost data from systems that belong to one or more SoS. Software cost model developers will be able to tap into this resource to help validate their models and systems developers will be able to review data in the repository to help in their cost estimations. The repository data that can be accessed will remain anonymous with respect to the source of the data (see the “Call for Data” sidebar). The user interface for browsing or searching the repository will allow search by System, System-of-System or constituent system characteristics that include size and functional domains.

DACS user feedback and numerous technical inquiries have suggested the need for a single point of access to comprehensive and uniform information on software development tools and technology. Beginning in 2008, the DACS was funded to develop a prototype Software Development Tools and Technology Information Clearinghouse (SDTATIC). The idea is that when users are selecting development tools as part of their product development lifecycle, SDTATIC would be a resource that would allow them to understand the breadth of available tools to support their needs, help them select the best tools, and to find unbiased information about the tools. SDTATIC is still in the prototype stage, but can be seen at www.sdtatic.com. It is intended to be a collaboration of tool vendors, subject matter experts, DACS staff, and tool users to provide technical and usage information about the tools. We believe SDTATIC will become a highly visible and heavily used resource by our users.

Related to the SDTATIC initiative, the DACS is planning to initiate an annual software development Tool Workshop. Each year, the DACS will select a tool area (e.g., model driven testing tools), sponsor and coordinate an SME-led workshop to identify technical gaps in the tool area and collect the latest information on software development tools. Subsequent to the workshop, the DACS will then publish a Critical Review/Technology Assessment for that tool area for all to read.
DACS users can now follow us on LinkedIn. We will disseminate news, interesting and timely technical information, and event information through these social media channels. These venues provide us a vehicle to begin developing communities of practice.

Join us for discussions on software and systems engineering; new development technology, research, and acquisition.

In collaboration with the Reliability Information Analysis Center (RIAC), of which Quanterion also plays a key role in performing Core operations, we will establish a DACS/RIAC Software Reliability Partnership. This partnership will focus on collection and dissemination of technical information, and training activities related to software reliability. Software and systems reliability will continue to be an ongoing focus area for the DACS, especially with the DACS collocation with the RIAC.

I welcome your input on what the DACS is doing, how it could be better, and suggestions for new DACS activities. As you can see from this article, while many things will remain the same at the DACS, many exciting new initiatives are planned. All we do at the DACS is done to meet our mission of facilitating the use of software technology scientific and technical information in the design, development, testing, evaluation, operations and maintenance for DoD systems.

About the Author

Thomas McGibbon is the Director of Software Engineering for Quanterion Solutions Incorporated, assigned as the Director of the Data & Analysis Center for Software (DACS). He has over 30 years of experience in software development, systems development, and software project management. Mr. McGibbon has been DACS Director for over 15 years; is author of several DACS state of the art reports on software engineering topics; and holds a MS in Software Engineering from Southern Methodist University and BS in Mathematics from Clarkson University. Mr. McGibbon is a Certified Software Development Professional (CSDP).

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DACS Call for Data

ROI Dashboard©

The ROI Dashboard© supports a need for organizations who must justify investments in software technical and management improvements from a financial perspective. It relies on publicly releasable data from open literature or from user submittals. The more comprehensive the data is in the ROI Dashboard©, the better the results. You can contribute towards more reliable indicators of the costs and benefits of software technology by contributing data. The collective result of many individual contributions of data is a resource for financial analysis available to all, including yourself.

DACS-USC CSSE Systems and Software Data Center

Software-intensive system development, often targeted for a network environment, has led to considerable changes in processes in order to be able to rapidly respond to evolving mission needs. In addition, engineering is often required at the system of systems (SoS) level in order to better integrate multiple systems with respect to overarching capabilities. As development processes become more incremental in nature as well as more agile, software and system cost models must also be adapted. Efforts are currently underway to better understand agile incremental software and system development effort as well as SoS engineering (SoSE) effort and to use this information to develop an SoSE cost model to estimate this effort as well as to refine software development and systems engineering cost models for systems that participate in one or more SoS. To continue this cost model development, we welcome software and systems engineering data from single systems that are part of one or more SoS as well as SoSE data from SoSE teams.

Anonymity of Data

We recognize that any data you may provide to the DACS may be confidential data to you or your organization. It is our intent to store and present your data without attribution. Our Data Collection Policy enforces the need for masking identifying information in our data systems and repositories. We will sign non-disclosure agreements with all parties submitting data.

To learn more or to contribute data to these research efforts, or to receive other assistance from the DACS, please contact the DACS Director.
The DACS Gold Practice Initiative:

- Promotes effective selection/use of software acquisition & development practices
- Defines essential activities/benefits of each practice
- Considers the environment in which each practice is used
- Addresses the timeliness of practice benefits
- Recognizes interrelationships between practices that influence success or failure
- Contains quantitative and qualitative information
- A continually evolving resource for the DoD, Government, Industry and Academia
- Free to use/free to join

Learn More About the DACS Gold Practice Initiative:
http://www.goldpractices.com

Current Gold Practices:

- Acquisition Process Improvement
- Architecture-First Approach
- Assess Reuse Risks and Costs
- Binary Quality Gates at the Inch-Pebble Level
- Capture Artifacts in Rigorous, Model-Based Notation
- Commercial Specifications and Standards/Open Systems
- Defect Tracking Against Quality Targets
- Develop and Maintain a Life Cycle Business Case
- Ensure Interoperability
- Formal Inspections
- Formal Risk Management
- Goal-Question-Metric Approach
- Integrated product and Process Development
- Metrics-Based Scheduling
- Model-Based Testing
- Plan for Technology Insertion
- Requirements Management
- Requirements Trade-Off/Negotiations
- Statistical Process Control
- Track Earned Value
Meet the DACS Team

Team members include: State University of New York Institute of Technology (SUNYIT), University of Southern California (USC), Syracuse University CASE, and Allen Corporation.

The State University of New York Institute of Technology (SUNYIT) hosts the DACS on its campus near Utica, NY, where faculty, researchers, and students will actively support DACS operations and technical projects. SUNYIT brings a tradition of Information Technology-related education and research to the DACS through its programs in computer science, computer information systems, engineering, and telecommunications. Faculty members and graduate students actively engage in research in areas such as systems theory and science; data mining; probabilistic databases; high performance computing; web archiving; nanoelectronics; digital forensics; computer gaming; optical and wireless networking and wireless system security; and data security and cryptography.

SUNYIT will serve as the “gateway” to other campus research centers within the SUNY system to address the system and software issues associated with other new and emerging technologies that will be part of tomorrow’s military systems and commercial products. SUNYIT faculty will be available to test and evaluate new information and knowledge management technologies and strategies. Students will have the opportunity to engage in research and capstone projects under the supervision of faculty members in information knowledge and management areas.

SUNYIT enrolls about 2,500 students in undergraduate and graduate degree programs in technology, professional studies, and the liberal arts on the newest campus in the 64 member State University of New York system – a high-tech learning environment on more than 800 acres in Marcy, N.Y.

SUNYIT is the home of The Reliability Information Analysis Center (RIAC) formerly known as the Reliability Analysis Center (RAC), that also serves as a Department of Defense (DoD) information analysis center (IAC). As an IAC, the RIAC is a Center of Excellence and technical focal point for information, data, analysis, training, and technical assistance in the engineering fields of reliability, maintainability, quality, supportability, and interoperability (RMQSI). Chartered by the DoD, the RIAC also undertakes a variety of other government and industrial support projects each year. The team is led by Wyle Laboratories and includes Quanterion Solutions Incorporated (QSI), the University of Maryland Center for Risk and Reliability, the Pennsylvania State University Applied Research Laboratory (ARL), and the SUNYIT. Resources at the nationwide locations include over 2,000 employees of various technical backgrounds and expertise. The RIAC operation serves as a model of successful government-industry-academia cooperation and collaboration in addressing the technical needs of both the defense community and commercial industry.

SUNYIT has named Professor Christopher Urban as its lead for the DACS collaboration. Chris is a faculty member in the SUNYIT Department of Computer Science. While at SUNYIT he has participated in research projects involving the U.S. Department of Labor, the New York State Department of Labor, CompTIA, and the Reliability Information Analysis Center. He holds a Masters Degree in Information Systems from the Naval Postgraduate School and a Masters Degree in National Security and Strategic Studies from the U.S. Naval War College. Prior to joining the SUNYIT faculty in September 2000, he spent 20 years as a Naval Officer and retired with the rank of Commander. He was an aviator who also served as a Chief Information Officer and he was a faculty member at the U.S. Naval Academy in Annapolis, MD.

The University of Southern California (USC) Center for Systems and Software Engineering, founded by Dr. Barry Boehm in 1993, is part of USC’s Viterbi School of Engineering. This Center is well-known for its research and development of practical software technologies that can aid industry in reducing cost, customizing designs, and improving design...
quality. This is accomplished by doing concurrent software and systems engineering, while also meeting the requirements of the Center for research topics that will facilitate the training and education of skilled software leaders, armed with PhD degrees. Current focus areas of research within the center include value-based spiral model extensions, COCOMO cost-schedule-quality estimation model extensions, COTS-based system development, and agile methods. The DACS has been an affiliate of USC’s CSSE for several years, allowing DACS access to USC’s CSSE research being performed for existing affiliates. As part of mutual on-going collaborations, USC’s Dr. Barry Boehm and Dr. Jo Ann Lane recently developed a DACS state-of-the-art report entitled “Modern Tools to Support DoD Software Intensive System of Systems Cost Estimation.”

Dr. Boehm is an internationally renowned expert in software and systems cost estimation and agile software development whose insights and leadership will continue to be reflected in DACS products. He is the TRW Professor in the USC Computer Sciences and Industrial and Systems Engineering Departments. He is also the Director of Research of the DoD-Stevens- USC Systems Engineering Research Center, and the founding Director Emeritus of the USC Center for Systems and Software Engineering. He was director of DARPA-ISTO 1989-92, at TRW 1973-89, at Rand Corporation 1959-73, and at General Dynamics 1955-59. He is a Fellow of the primary professional societies in computing (ACM), aerospace (AIAA), electronics (IEEE), and systems engineering (INCOSE), a member of the U.S. National Academy of Engineering, and the 2010 recipient of the IEEE Simon Ramo Medal for exceptional achievement in systems engineering and systems science.

Dr. Lane, the USC DACS Technical Lead, is a Research Assistant Professor in the Industrial and Systems Engineering Department where she primarily focuses on system of systems engineering (SoSE) cost modeling, SoSE application of lean principles, SoSE test and evaluation, system development feasibility assessments, critical success factors for innovation in systems engineering, and the evolution of system and software lifecycle models and processes to manage risks, challenges, and complexities for SoSs. She joined the Center several years ago after an extensive career in industry as a program manager for the development of software-intensive systems.

As a technical partner in the new DACS, USC CSSE will assist Quanterion in identifying and documenting cost estimation, software intensive systems, software assurance, and system of systems information resources, topics, and practices. In addition, they will participate in various DACS collection, analysis, and dissemination activities; identify sources for DACS-related scientific and technical information and subject-matter experts; respond to technical inquiries from DACS users in the DACS technical domain of software technology, acquisition, and engineering; develop DACS newsletter articles and content for the DACS website.

The Syracuse University CASE (Center for Advanced Systems and Engineering) is New York State’s premier applied research center for interdisciplinary expertise in complex information intensive systems, including monitoring and control, predictive analysis, intelligence, security and assurance. CASE offers expertise in data fusion, data mining, systems modeling and analysis, bioinformatics, systems security and assurance, intelligent computing, and sensor networks.

The SU School of Information Studies (iSchool) was the first “information school” in the nation. It is a leading center for innovative programs in information policy, information behavior, information management, information systems, information technology, and information services. The iSchool brings a great deal of experience to the identification of scientific and technical documents on the web and other digital libraries.

The DACS will leverage Syracuse’s leading position among universities and state-of-the-art research in web-based information collection technology. That work includes extensive expertise in information retrieval, open source software, metadata development, and the architecture of digital libraries. Past activities include the development of metadata schema for the U.S. Department of Education including extensive semantic web technologies for the efficient gathering, organizing and re-distribution of educational materials, as well as reference services and building of communities of practice.
Leading the project for Syracuse will be R. David Lankes. Lankes has an international reputation in the field of library and information science. He has worked with the National Science Foundation, the Library of Congress, and OCLC on issues of database and clearinghouse modernization. He has spoken internationally on issues of participation in information services, and the need for greater inclusion of users in information systems.

Syracuse will be working on a unified metadata schema for documents and web resources. In addition to this infrastructure work, Syracuse will begin incorporation of expert communities of practice into DACS offerings. The idea is to leverage experts in the field to grow the DACS digital library offerings, and improve resources available to DACS users.

Allen Corporation of America, a small business, specializes in the design, development and validation of high assurance software and systems. Its focus on the development of trusted, high assurance, highly reliable and available systems brings both scientific and practical software expertise to the DACS team. With a strong research and development (R&D) capability, Allen's software team has been on the forefront of high assurance system development through many years of R&D contracts with government, military, and research organizations. Its expertise includes the design, development, validation and test of systems ranging from small components, including specialized embedded applications, to complete, enterprise-wide applications. Allen supports the DACS in training, products and software assurance.

Development of advanced software solutions today is changing at the speed of the Internet. With the advent of mobile devices such as the Kindle, iPad, Android, and others, the delivery of dynamic content is critical. This delivery, however, is not just about converting paper-based books and reports into a new format, but rather the very nature of how critical software development and analysis resources are conveyed must undergo a radical change. In specific areas, such as the DACS, the concept of personalizing access via these new media is an important consideration. As software based research and development activities expand in both scope and speed, providing the best information in a variety of forms is critical. In order to support this rapid evolution, Allen will be assisting the DACS in adapting and modernizing its information dissemination methods that would take full advantage of new delivery technologies. A key capability that Allen brings to the Quanterion team is in providing innovative products that deliver timely, relevant and hard hitting information in a variety of formats.
Allen offers a full range of learning capabilities to increase performance and identify the most cost-effective strategies to meet the unique training needs of DACS users, particularly in transitioning from traditional delivery methods, such as classroom courses, to e-Learning initiatives. Allen, using the Instructional Systems Design (ISD) methodology based on the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) Process Model, efficiently tailors comprehensive instructional programs, designed to solve customers’ most complex challenges and delivers increased productivity while improving organizational agility. Allen has a highly talented team of instructional systems designers, graphic artists, and technical programmers for custom courseware development. Its training solutions include a state-of-the-art Web-based portal for on-demand customer access to project status, training storyboards, and development content, as well as providing a complete training program management tool.

Chet Hosmer is Sr. Vice President and Chief Scientist of Allen Corporation of America and its wholly-owned subsidiary, WetStone Technologies, Inc. He has over 30 years of experience in developing high technology software and hardware products, and during the last 20 years, has focused on research and development of information security technologies, with specialty areas including: steganalysis, digital forensics and malicious code examination. Chet is a frequent keynote and plenary speaker on the subject of cyber crime. He is on the editorial board for the Journal of Digital Forensic Practice and the Digital Investigation Journal, and is editor of the International Journal of Digital Evidence. He is co-chair of the Electronic Crime Partnership Initiative at the National Institute of Justice, and has served as visiting professor at Utica College and adjunct professor at Syracuse University. Chet holds a B.S. Degree in Computer Science from Syracuse University.
The DACS – Past and Present
By David H. Rose, Manager of Advanced Programs - Quanterion Solutions Incorporated

Introduction
The Information Analysis Center (IAC) program sponsored by the Defense Technical Information Center (DTIC) entered a new era on July 1st of 2010 when it awarded a contract to operate the Data and Analysis Center for Software (DACS) Basic Center Operation (BCO). DTIC has long sponsored IACs with the intent of providing scientific and technical knowledge and capabilities in a variety of technical areas. For example, Terry Heston’s article entitled “A New Era for the IAC Program and DACS” which can be found in this issue of Software Tech News, lists the ten current IACs. Each of these centers has a “Core” operation, which provides the day-to-day operation that responds to customer needs by providing basic products and services. The contracts awarded to the operators of these centers all have indefinite delivery, indefinite quantity (ID/IQ) provisions that enable government customers to easily place task orders to obtain technical support from the subject matter experts on staff at each center. Before talking about the new DACS, however, it’s important to first look at its history so that you can fully understand the evolution of the center into what it is today.

DACS History
The timeline below shows the history of DACS, from its origins as a pilot study conducted by the Rome Air Development Center (RADC, now the Air Force Research Laboratory’s Rome Research Site) to its latest implementation with the DACS BCO operated by a small business. Included on this figure are the major contract-related events that have occurred over the years as well as a few more recent major technical initiatives.

Figure 1: Timeline Showing the History of DACS
As can be seen on Figure 1, the DACS website was first stood up in 1995. Since that time, DACS has worked on several initiatives and community outreach efforts that significantly expanded the capabilities and information available through the site. For example, DACS wrote a State-of-the-Art Report entitled “A Business Case for Software Process Improvement: Measuring Return on Investment from Software Engineering.” This report was initially written in 1996 and it formed the basis for the DACS “Return on Investment (ROI) Dashboard”, which is a tool used to determine the impact that software technology improvements will have on productivity and quality. Another example of a strategic DACS initiative is the “Gold Practices”, which is a collection of twenty software-related best practices designed to be used during acquisition and development programs. The ROI Dashboard© and Gold Practices are both free resources available through the DACS website.

For the last twenty-two years, ITT/Kaman successfully provided the innovation and leadership needed to develop the innovative products and services provided by DACS. However, the IAC program’s new acquisition strategy and subsequent decision have made the DACS BCO a small business set-aside. As discussed by Mr. Engelhart in his article entitled “Welcome to the New DACS!,” ITT has been very helpful in transitioning the DACS to Quanterion so that the change in operational management was truly seamless and transparent to the customer base.

The Mission and Scope for DACS

The mission for DACS is the same as all other DTIC sponsored IACs, which is to collect, store, analyze, synthesize, and disseminate scientific and technical information. What differentiates DACS from the other IACs is its technical focus and scope, which concerns, but is not limited to information on the research, development, testing, and evaluation (RDT&E) of software technology. Included in this scope are all aspects of identified or potential military and national security-related applications of software technology of devices, systems, and processes as well as the development of tools and techniques for the collection, analysis and dissemination of software technology-related scientific and technical information (STI).
In simple terms, DACS is responsible for the evaluation and development of conventional and non-traditional software, systems, and systems of systems technology techniques. Figure 2 provides a listing of specific technical areas that fall under the scope of DACS.

As described elsewhere in this issue, Quanterion has put together an extremely capable team that can tap into the software engineering expertise at some of the top universities in the country. Additionally, our relationship with the Allen Corporation will help transition some of the technical capabilities that will be developed under the new center through the production and marketing of innovative products and services. Combined with the nine large businesses that are part of the Software, Networks, Information, Modeling and Simulation (SNIM) Multiple Award Contract (MAC) team, the capabilities available to the DACS customer base have never been better. Watch us as we grow to provide even higher levels of support and services over the coming years.

About the Author

Mr. David Rose is the Manager of Advanced Programs for Quanterion Solutions. Prior to joining Quanterion, Mr. Rose spent 8 1/2 years as the Director of the Advanced Materials and Processes Technology Information Analysis Center (AMPTIAC) and its successor, AMMTIAC. He is a retired US Air Force officer and has a BS and MS degree in Mechanical Engineering. In November of 2009 he became a Ph.D. candidate at the University of Dayton, where he is pursuing a degree in Materials Engineering.

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The STN is a theme-based quarterly journal. In the past DACS has typically solicited specific authors to participate in developing each theme, but we recognize that it is not possible for us to know about all the experts, programs, and work being done and we may be missing some important contributions. In 2009 DACS adopted a policy of accepting articles submitted by the software professional community for consideration.

DACS will review articles and assist candidate authors in creating the final draft if the article is selected for publication. Note that DACS does not pay for articles published. Note also that submittal of an article constitutes a transfer of ownership from the author to DACS with DACS holding the copyright.

Although the STN is theme-based, we do not limit the content of the issue strictly to that theme. If you submit an article that DACS deems to be worthy of sharing with the community, DACS will find a way to get it published. However, we cannot guarantee publication within a fixed time frame in that situation. Consult the theme selection page and the Author Guidelines located on the STN web site (see https://www.softwaretechnews.com/) for further details.

To submit material (or ask questions) contact news-editor@thedacs.com

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