# INTRANET/INTERNET Technology and the Warfighting "A New Concept for the JFACC, the AOC, and CTAPS"

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*Note from the Editor: The appetite for technology that utilizes the internet grows exponential year after year. It has only been an aid to the warfighter and C2. Future C2 concepts such as JADC2 are possible because of the internet. This article reminds the Joint Force that the internet is a powerful tool that has allowed the warfighter to become successful on the global scale because of instantaneous access to and dissemination of information.*

## Can Intranet/Internet Technology Help the Warfighter?

Intranet/internet is exploding as a technology. It's in the daily news; people discuss it frequently; every person is becoming familiar with the technology, and we are using the internet in greater numbers every day. Can this technology be used in an operation where large amounts of information need to get to many organizations across different operating systems with diverse computer languages and varied operating systems? The answer is an overwhelming yes! Currently, the military uses the Contingency Theater Advanced Planning System (CTAPS) to support the joint forces air component commander (JFACC) and many other systems. The computer requirements are more detailed in a later section. The numbers of the required systems, still to buy, to equip, and then train all organizations to use the equipment represents a considerable cost in money and time.

The Department of Defense (DOD) forces have viewed the joint air operations center (JAOC) as a growing information monster in terms of how can we connect everyone and send the information they need by similar systems. Intranet/internet, or what was originally called Advanced Research Project Agency (ARPA) Net, overcame this problem years ago with information flow over different systems and different language-based computers. The military needs to take advantage of the intranet/internet/ARPA net solution and adapt it to today's situation in joint contingency operations.

Combined Air Operations Center (CAOC) at Al Udeid Air Base, Qatar, provides command and control of air power throughout Iraq, Syria, Afghanistan, and 17 other nations. The CAOC is comprised of a joint and coalition team that executes day-to-day combined air and space operations and provides rapid reaction, positive control, coordination, and de-confliction of weapon systems. (U.S. Air Force photo by Tech. Sgt. Joshua Strang)

The JAOC can simply set up a classified web homepage and everyone can use their equipment, web browser, and internet technology. To do this, common gateway interfaces need to be developed with similar information requirements as CTAPS. The air tasking order (ATO) is simply a file that can be requested, as an air or ground picture is also simply a file, or any imagery is a file. All of these "files" can be requested and sent by way of a classified connection to a personal computer (PC), Macintosh (Mac), or UNIX workstation, or it could even go to a hand-held personal information manager (PIM), PC, or Mac based, with a classified cellular phone connection. This will overcome the requirement to purchase, equip, and train over 1000 units that could be tasked to participate in a real-world contingency and need an interface with the joint air operations information. The cost of developing a homepage is minimal. Many units are doing it every day. More and more people are becoming familiar with how to use internet browsers. It would overcome the need for equipping and training on the use of UNIX driven CTAPS at the remote location units. During Desert Storm, we had over 60 remote command and control (C2) UNIX terminals. More units wanted them, but we were limited due to various reasons. This internet concept would allow unlimited authorized secure access. This is cheap, "do it right now," solution, in contrast to buying over 1000 UNIX terminals and providing the minimum training, and establishing the

system to support the entire operations. A commander in a conference room with a laptop computer could call up, through a secure telephone line, receive an air, ground or sea picture, the ATO or airspace control order (ACO), or any parts of these documents, and finally see the current status of all air operations without costly equipment and training.

The DOD will still need to train people and equip the JAOC with complex and capable computer technology to plan, analyze, observe, assess, produce, publish, execute, monitor, and adjust the joint air operations activity. This article only deals with the external or remote requirements of the forces that need to be connected in future joint operations.

Finally, the transfer of JFACC authority and C2 systems from one service component to another could be facilitated by this internet solution. Anyone with secure communication and authorization could log into multiple JAOCs to observe and monitor activity and transfer information. This multiple JAOC interconnect is very difficult if not impossible to accomplish within the systems we currently use.

**Viewing the Information Flow in the JAOC from a Different Perspective**

When the process of joint air operations is examined over the last 5 decades since World War II (WWII), then compared to the very recent years since computer displays have been part of operations, it becomes obvious that it has developed from within and has continued to grow in different ways while constantly reflecting to the days of WWII. We started with large plexiglas grease boards to display activity. Today, we use computers called CTAPS. CTAPS is the electronic grease board of the computer age. Throughout the process of development, the information was always sent out of the JAOC, so it was natural to consider attaching the operating units via local and wide area networks (LANs and WANs) using CTAPS terminals. The remote terminal concept was successfully used during Desert storm for the first time during a real-world contingency.

Presently, this concept continues to expand. The JAOC develops the plan for the flying units to execute, and the units receive the plan over the CTAPS network or other message processing system. The concern is many of the flying or other tactical units have not been equipped with the UNIX Sun Sparc CTAPS Terminals. The DOD has also not provided to the bulk of these tactical level units the training to hook up and operate a remote system to run the CTAPS applications. The equipment, training, and logistical support is slowly catching up with the requirements but there is still a long way to go. Looking at the requirements one must ask, is there a better way to accomplish this distribution of the information? This article will demonstrate there is.

Currently, sending information out to similarly configured UNIX terminals and the operating applications resident on these computers to interface with the prescribed database structure is the basic concept. This requires significant training and equipment purchase, as well as logistical support to be established. Many tactical level units, which will operate under this system, remain unaware of their requirements because they don't use this centralized CTAPS daily. They mostly do their planning and execution in a "stand alone environment". This article deals with an alternative look at getting the information to the units and their responses needed for planning using common internet style systems that many people are becoming more familiar with every day.

The solution can be a simple one. Use internet browsers over a classified network or dial up classified phone lines that will operate on any PC, Mac, or UNIX machine that most units already possess. Develop a web style home page with similar information forms covering the needs of the JAOC and the remote users so information can flow from a UNIX centralized system through a simple and easy to use browser at the remote facilities. A homepage site could be developed in the JAOC, or any alternate location, giving an infinite number of connections from the remote, at a level of classification acceptable to the information used. Even complex high-end computer displays could be sent to the remote using simple PC type color cameras. These are commonplace on the internet and very inexpensive.

The military organizations typically think in terms of graphics displays requiring the use of similar computer capability at all sites. This alternate concept of using classified browsers would overcome the complex system administration set up, purchase, and use of different computer systems for different applications and allow a dial-up capability with a laptop, and can be established quickly from any location in the world.

This concept gives a commander from any location in the world with a classified phone or network and a laptop the possibility to call up the JAOC homepage and evaluate any application or display without expensive, complex, and time consuming activity. Or if the commander or anyone was in the JAOC facility with a classified infrared source, a handheld computer PIM or personal digital assistant (PDA) could be used to access the information while in any room. This flexibility of information distribution and display has more innovation opportunities than can be covered in this article. The move to increase bandwidth to accommodate larger and larger volumes of information can be redirected to use only the information required in a simple easy-to-use system.

**JFACC Responsibilities**

The concept of the unity of effort and centralized command structure is not new. The idea behind the JFACC philosophy has many historical references such as, Sun Tzu's book, *Art of War*, written in 500 BC with the concept of the unity of effort, WWII with its change to centralized command and decentralized execution, and Desert Storm which used both concepts. The list of successes continues to grow. Who appoints the JFACC and what is the normal responsibility? Answer: the joint force commander (JFC) or commander in chief (CINC) is responsible for the overall campaign that includes three key air operations type activities. The JFACC will normally be designated as the responsible agent for (1) overall air operations, (2) airspace control authority, and (3) area air defense commander.

What system will be used to accomplish these responsibilities? The answer is CTAPS today, Theater Battle Management System (TBMCS) in 97-98, and Global Command and Control System (GCCS) in a few more years.

A typical question is from what service will the JFACC be? The answer can be simple or complex. The simple answer is whoever the JFC or CINC appoints. The complex answer is, whoever has the preponderance of air power and the C2 ability to plan, control, and manage it.

The Navy, Marines, and Air Force have all trained to assume the responsibility of the JFACC role, but the final decision will usually be based on the type of operations and the size of force structure involved. Who will be responsible for these activities and who will deconflict them? The JFC or CINC will decide but normally this will be the JFACC's job. There may be a transfer of JFACC command from one service to another during a contingency which can be a difficult task. The changing of a flag is simple, but the transfer of developed databases using sometimes different computer systems can be a time consuming, challenging process.

## Organizational and Hardware Requirements

Where does the JFACC organize and perform these three assigned responsibilities? Normally the organization will be called the JAOC, air operations center, combined air operations center, tactical air command center, tactical air control center, or hardened tactical air command center. These different organizational names will be referenced using the one term JAOC. The names are different due to the commander's or service's choice of names and historical titles. While the names and internal organizational structural names may be different, there are many similarities. All perform the tasks of situational awareness, situation analysis, and assessment, planning, publishing the air tasking order/message, and ACO. They will all monitor and execute the ATO and ACO and readjust air operations when necessary. Currently, there are many different service organizations, (see Figure 1) that could be tasked to produce an ATO. The number of the JAOCs will likely grow, depending on future contingencies. The forces assigned to each task force will also likely be different.

In addition, each JAOC may be deployed in different sizes for a small, medium, or large capacity. Each JAOC requires CTAPS computer terminals as well as many other different types of computers to plan, publish, execute, and monitor the overall activity. Each JAOC is also different due to many variables such as coalition involvement and historical systems and many other interests.
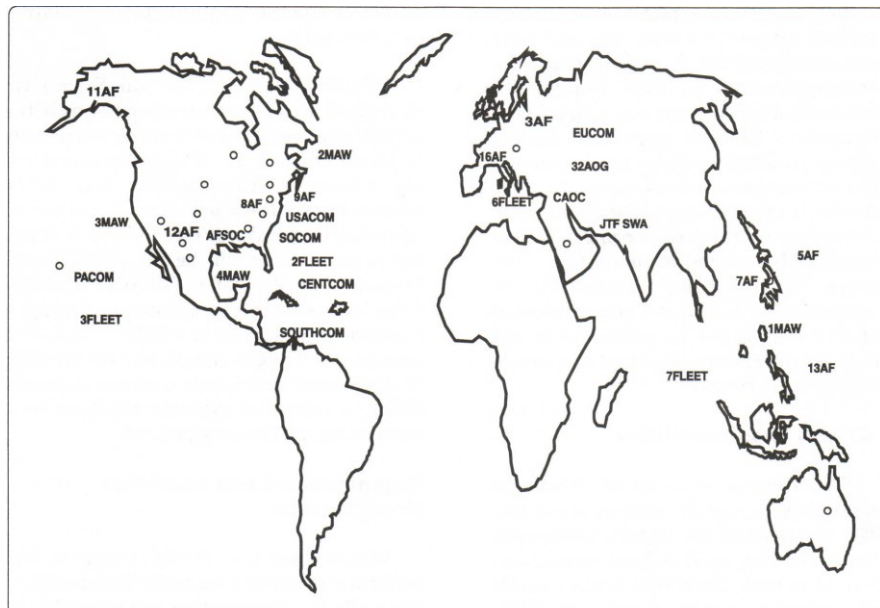


Figure 1. JAOC Organization

Every flying and other tactical type unit needs access to the information on the ATO and to know the status of everything at various times. If you take the numbers of all the units in the services outside the JAOC that would need a CTAPS terminal, the number is quite large. For example, there are over 360 flying units according to the May 1996, *Air Force Magazine*. Adding the Navy and Marine flying units number would certainly double to 720. Finally include others such as radar and air defense units, those involved with a coalition operation, and the number of organizations could easily be over 1000 squadron-size units. If we only deployed a wing-size unit to one theater at a time, this number would be smaller, but the current move is to deploy squadron-size units to different areas of interest in different theaters. Considering each unit's requirements to connect to the JAOC for deconfliction and operational activity, the number of required terminals is quite large. The system administration of hooking up a large force structure can be a tremendous challenge and a daunting task. Currently very few of these wing or squadron-level tactical units possess CTAPS and only a small number have experience operating within a CTAPS. Distributing a terminal to every tactical unit involved just before a contingency has been what has happened in the past few years, but this has complicated the training and use of this complex equipment. To do it right, every potential unit should be equipped and trained to use CTAPS equipment before the start of operations. The cost and resource savings in redirecting the use of simple, current "intranet/internet browser" technology could save valuable resources to further develop and refine the central facilities' computer requirements and capabilities.

## Mosaic Style Browsers versus Use of CTAPS at Remote Facilities

The conceptual change from using CTAPS remotes to a concept of classified web browsers could be accomplished in the near future and save considerable resources. If you look at the initial number of over 1000 tactical units or more in DOD that could participate in a contingency as execution or supporting activity, the cost of purchasing the UNIX computer terminals, software, associated printers, and hardware for all these units would be over $20 million. This amount doesn't consider the training or logistics cost to provide continued support.

The concept of classified internet browsers versus UNIX terminals would allow the browsers to be hosted on any existing computer resource in any unit. This covers PC, Mac, PDA as well as UNIX and other computers. In addition, this would allow the use of current printers and the import and display of information through existing resident systems. The internet concept developed by ARPA Net years ago overcame this problem of incompatibility of systems with a language any system could use. The average person is becoming familiar with internet browsers such as Mosaic or Netscape. These programs could be the interface with the information distribution in the JAOC. This would immediately decrease the hardware, training, and logistic requirements.

To accomplish this concept, this JAOC website would have to become part of the concept of operations and be institutionalized in all Unified Command's areas of responsibility. This concept could easily be adapted as well, to many other types of information process requirements. The difficulties in coordinating service-specific computer equipment and systems and the sharing of common interest information and databases could be overcome with this technology.

The JAOC will continue to use CTAPS and other systems in the future, but the development of a secure website at the JAOC to use as an interface with remotes is something we can do with limited resources today. It would work with today's equipment and offer more flexibility than ever before.