Cyberspace Content Management Technician (MOS 255A)

By CW5 Todd M. Boudreau

To fully grasp the evolution and current role of the Army's cyberspace content management technicians you have to embrace one significant fact that is often misconstrued. Signal warrant officers are not Subject Matter Experts. Instead they are Systems Matter Experts.

Perhaps we should use SysME instead of SME to alleviate confusion.

To clarify this point, consider the current definition of a warrant officer from DA Pamphlet 600-3 (February 2010): "The Army warrant officer is a self aware and adaptive technical expert, combat leader, trainer, and advisor. Through progressive levels of expertise in assignments, training, and education, the WO administers, manages, maintains, operates, and integrates Army systems [underline added for emphasis] and equipment across the full spectrum of Army operations. Warrant officers are innovative integrators of emerging technologies, dynamic teachers, confident warfighters, and developers of specialized teams of Soldiers. They support a wide range of Army missions throughout their career."

This point is significant. With the complexity of today's communications systems, our Signal warrant officers cannot afford to limit themselves as SMEs. That is the role of the junior NCO. One look at a requirements document that lists a Signal warrant officer will reveal a number of enlisted positions that function as SMEs. The warrant officer position is then required to be a SysME--one who brings each related component (subject) and integrates it into the total--the system. Indeed some Signal warrant officers are SMEs, but SysME more accurately describes their increased sphere of responsibility.

Another important point to consider before we move to the objective 225A is that we are like a formation in motion. By this I mean that there are still legacy issues that our Signal warrant officers face in their individual MOS. Due to doctrine, organizational designs, current equipment, systems, and legacy leadership ideology, the description of a 255A indicated in the following narrative will not immediately materialize.

We can't make an immediate right flank, march. Instead, we are in the beginning of a column right in which you will have some units immediately receiving newly trained 255A, N, and S and employing them as envisioned. These units have already made the turn. Other units, however, will find themselves further back in the formation and as such, the designated 255A Soldier will still be performing duties that are shifting to 255N (e.g., Local Area Network installation, operation, and maintenance).

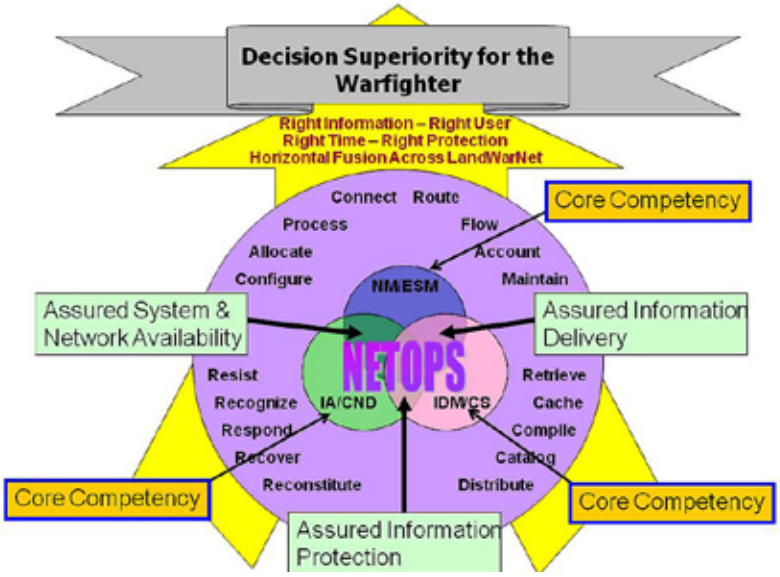

Diagram 1

Finally, for the sake of clarity, I will categorize three separate but related systems, one per element of network operations. Above is the NetOps construct that shows its three elements which I will simply state as cyberspace content management, cyberspace network management, and cyberspace defense. See diagram 1 above.

Two more notations are necessary to frame this discussion. First, because these three are 'elements' and not 'enablers,' NetOps does not exist unless all three are in play. Second, the purposed overlap indicates higher level NetOps functions within an element that is either supported by or supports another element. These concepts will be further defined in later articles on MOS 255N, 255S, and 255Z.

The MOS 255A technician, one of two future enlisted-level accessions MOS (255S is a warrant officer-level, i.e., W3 accession MOS), is responsible for cyberspace content management. This is the Army's premier information systems and services technician MOS. The 255A technician is charged with establishing and maintaining the ability to collect, process, store, secure, search for and discover, retrieve, and disseminate information utilizing the application layer environment of the Army's portion of the cyberspace domain. They administer and manage systems which perform Information Dissemination Manage-

ment/Content Staging in order to enable Information Management/ Knowledge Management functions supporting combat information superiority and decision dominance.

Where We Were

In more than two decades, MOS 251A, Information Systems Technician, created in October 1987 which was previously coded MOS 741A, Data Processing Technician, had only seen two significant revisions during its lifetime. Both occurred in September 2000 when all COMSEC functions were transferred to MOS 254A and all CW5 positions were transferred to MOS 255Z.

However, we are in the midst of its close out and most significant revision. MOS 251A is combining with MOS 254A and subsequently will be converted to MOS 255A, Information Services Technician. While MOS 254A, Signal Systems Support Technician, saw its inception in September 2000, it has only been effective since April 2003. Less than a decade later, it too will be deleted as it is combined with MOS 251A and converted to MOS 255A as well.

Two years ago, it was decided that these two MOS (251A and 254A), due to the forces of transformation and technological advances which caused MOS 254A to shift into a role it had not planned to fill in its inception, had come to mirror each other in most of the critical skill-sets.

There were also a number of other issues that required immediate attention to include the grade pyramid which ensures an adequate base of junior positions to support a smaller number of senior positions as well as adequate numbers of senior positions to support future advancement and promotion potential. In 2007, the base of this pyramid for MOS 254A was grossly over the Army standard resulting in little promotion potential for this MOS; concurrently, it was upside down for MOS 251A resulting in numerous junior 251As filling more senior 251A positions."

Where We Are Heading

Apprentice Cyberspace Content Managers

Junior 255A (i.e., W1 and W2) focus on acquiring and refining technical and administrative skills as they directly plan, install, administer, manage, maintain, operate, integrate, service, secure, and troubleshoot information systems and services and supervise and train personnel at the brigade level. Their focus is mainly on the applications and systems and how to leverage them to assist their commander to prosecute the collective unit mission. They are concerned with the systems that provide the capability to manage, manipulate, and disseminate information.

The term 'apprentice' must not be misunderstood. Newly appointed CyCMs, while apprentices as warrant officers, are not new to information technology. They average 10 years active Federal service with a minimum of four years documented practical experience in IT administration, Army battle command system administration, local area network administration, and/or information assurance/ computer network defense. Nor are they apprentice leaders since the average grade at time of accessions as a Signal warrant officer is staff sergeant. As a minimum, they must have at least 36 months of documented rated time as a leader as evidenced by official NCO evaluation reports.

However, in their new realm, they are apprentices. As such, the junior CyCM begins to learn each and every 'subject' within their 'system.' Being an SysME does not allow them to abdicate their responsibility to be an expert in each one of the subjects under their purview.

The goal is that they fully realize their role as a "self aware and adaptive technical expert, combat leader, trainer, and advisor" which will only occur if they are the consummate experts over each subject assigned to them. In that, as a WO1/CW2, their "primary focus is becoming proficient and working on those systems linked directly to their AOC/MOS" (DA Pam 600-3), this is the time for them to lay their foundational understanding of the devices and applications used in their system.

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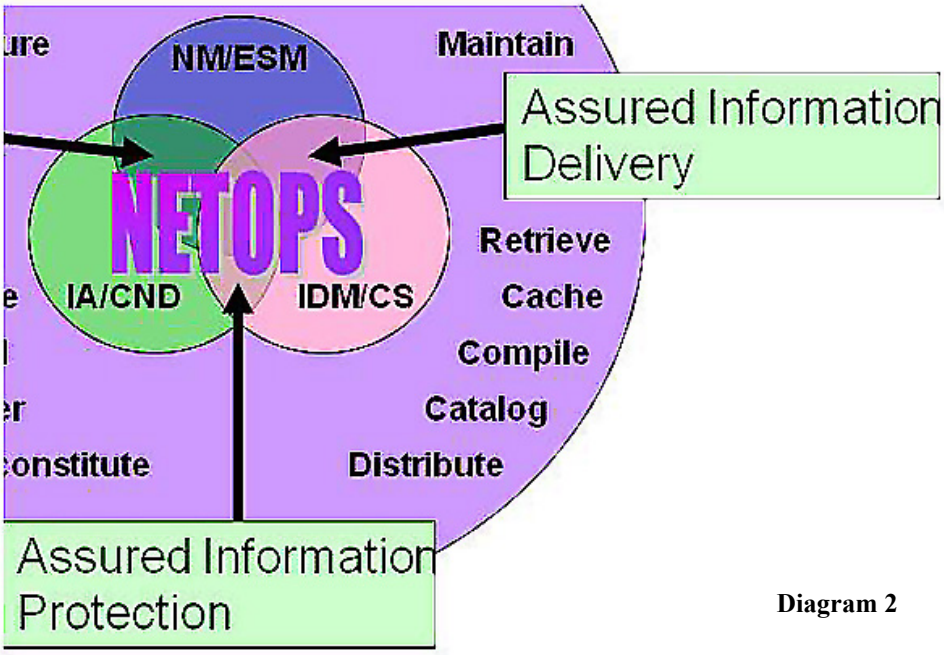

Diagram 2

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The WO1/CW2 255A focuses on the install, maintain, and operate aspects of the system in which they are responsible. They are to focus on the individual pieces of their system, many of which they were trained on in their WOBC. Examples of such devices and applications in today's Army inventory includes (but are not limited to) servers, storage area networks, battle command common services, exchange, active directory, SQL, SharePoint, Adobe Connect, virtualization, video teleconference systems, information systems and services level Information assurance management, standard Army management information systems, etc. See diagram 3. It is noteworthy that this repurposing of MOSs along with changes in technology has shifted various responsibilities to other MOSs. For example, the repurposing of our various MOSs has shifted COMSEC from MOS 254A to enlisted Soldiers working in sections under the 255S.

MOS 255S will not fill COMSEC custodial positions, but instead will be placed in positions of leadership over COMSEC sections. Additionally, tactical radio communications systems are networkable IP-enabled, node/PoP-self creating devices that inherently create cyberspace transport as they are operated. Thus they shift under the responsibility of MOS 255N. However, IA activities have not, nor will they ever, shift to MOS 255S. MOS 255A Soldiers are fully responsible to posture their systems and ensure those systems remain compliant to all IA policies, practices, and governance.

The apprentice CyCM is nominally assigned to a brigade combat team where he/she has the greatest ability to encounter the widest array of devices and applications found within the breadth of assigned systems. Having spent approximately eight months in WOBC, the BCT is not only the level where junior warrant officer positions are most prevalent, but also provides the best opportunity to see the system put to use by its intended user – the combat commander. The astute apprentice CyCM uses this opportunity not only to provide the foundational training and experience in IT systems that he/she will build upon throughout his/her career, but he/she also is ever cognizant of the tactical purpose of these systems. He/she begins learning how to converse in IT communities and the tactics, techniques, procedures and vernacular of the combat arms community.

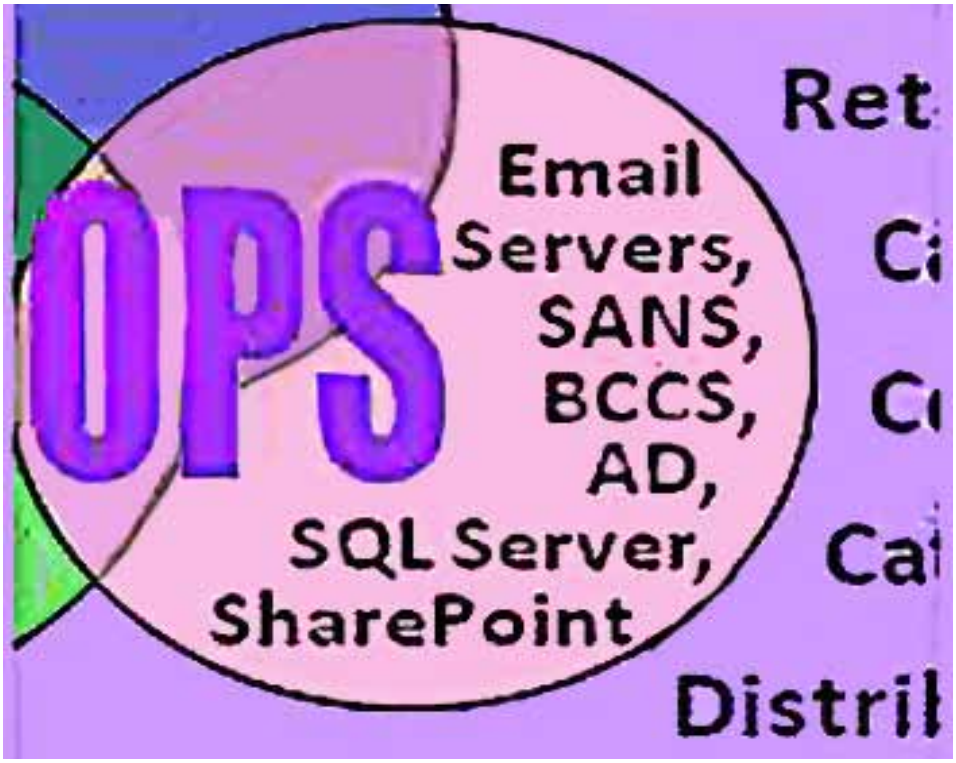

Diagram 3

It is important to note that the 255A MOS are not knowledge managers. Our 255A are technical officers who operate in the art, skill, and physical realm. They use practical aspects of physics [the physical technological devices that manipulate data elements] under the purview of their skills within the art of IDM/CS. KMs operate in the physiological and physics realm. They seek to understand the cognitive reasoning patterns of their principle and then leverage the practical aspects of physics [the physical technological devices that manipulate elements of information] in order to present the right actionable information to the primary decision maker at the right time.

For the KM, it is all about the actionable information becoming the correct knowledge. For the 255A, it is all about the systems controlling such information for manipulation by the KM. The 255A enables the KM.

KMs mainly operate in the cognitive domain while the 255A operates in the cyberspace domain. KMs decide what needs to be presented while 255As decide how (and sometimes if) something is presented. Most often success hinges on expectation management.

The best KM is attached to the principle decision maker to ensure they understand the decision maker's thought processing and get the right information presented at the right time in order to ensure the decision maker is knowledgeable on what the full scope of the

decision entails; to include second and third order effects. However, if the KM presents a plan to introduce either information that is not readily accessible or in a manner that is not practical, it is the 255A who will feel the pressure. Accordingly, the best 255A supports the principle decision maker's KM and thus must understand the KM's plans in order to help shape what will be presented to the principle decision maker; again, expectation management – and ensuring the mission is accomplished.

There is much, much more to this, but this provides a basic understanding. *(The next edition of the Army Communicator will address the KM subject in depth.)*

Journeymen Cyberspace Content Managers

Mid-grade 255A (W3) focus past the individual applications and devices to acquire skills in the individual attributes of CyCM (i.e., the science of IDM/CS) as well as the intricacies of the interrelationships with the other NetOps elements. This development prepares them to be true experts in their craft and advisors to senior leadership on complex and complicated NetOps issues. In accordance with DA Pam 600-3, as a 255A becomes "more senior, their focus becomes integrating branch systems into larger Army systems."

Journeymen CyCM, as advanced-level technical and tactical experts, now step slightly away from the devices, applications, and even the system they oversee and begin to seek an in-depth understanding of the principles and science behind their systems. See diagram 4. Having gained expert experience in how these devices operate, they learn the deeper answer to why they are developed and how they are leveraged to enable knowledge management. Virtualization, meta-tagging, etc. become the realm in which the journeyman 255A begins to operate. It is the intellectual capital of the master 255A that will help the Army move forward in optimizing and securing its data elements in the future.

The saying that 'information is power,' is an incomplete truth. It is more accurate to say 'information enables power.' And subsequently, if not properly managed, it may disable power as well. A commander's inability to quickly locate specific actionable data has the effect of disabling the power that can be brought into the fight. Journeymen CyCM seek to sharpen their skills in the art and science of Information Dissemination Management and Content Staging to ensure their warfighting commander is fully enabled through their KM. They find and leverage the newest technologies and techniques and thus enable their KM to empower their commander. They seek out professional forums to ensure they remain informed on technology advancements and trends as well as opportunities to further their educational training through university courses and civilian certification programs.

The journeymen CyCM is nominally assigned to a division or corps where he/she has the greatest ability to focus on the bigger picture. Still remaining close to the devices and applications within their systems of responsibility, they find themselves moving past the install, maintain, and operate mission and becoming involved with the planning and engineering of IDM/CS for large organizations. In preparation for the demands of such assignments, these CyCM will attend the 255A Warrant Officer Advance Course.

Prior to WOAC attendance, enrollment into the Action Officer Development Course (131 P00) must occur after promotion to CW2 in order to qualify for WOAC Prerequisite Studies credit. The AODC was adopted as the resource for this distance learning WOAC Prerequisite Studies course. It is completed on-line via the Internet, and provides warrant officers serving in CW2 or higher duty positions relevant training in organization and management techniques, communication skills, preparing and staffing documents, conducting meetings and interviews, problem solving, time management, writing, coordinating activities, and ethics. CW2s have the flexibility to enroll at any convenient time between 24 and 48 months of total warrant officer service. Once enrolled, the course must be completed within one year. Journeymen 255As attending their resident WOAC will find project management and enterprise level systems integration two key technical components taught to prepare them to fulfill their duties.

The journeymen CyCM's credibility is very high in assigned organizations and the influence they have cannot be underestimated. Mentorship of apprentice CyCM becomes an inherent part of their duty description. They also begin to gain more uniformity in the supporting and supported roles of their peer Signal warrant officers, the 255N Cyberspace Network Management Technicians and the 255S Cyberspace Defense Technicians. No longer do they focus their duties and responsibilities on their systems solely. Now they begin to fully understand that the data and information they are entrusted to manage is meaningless if it fails to reach its intended destination and/or becomes exploited or manipulated by a cyberspace adversary.

Finally, some journeymen CyCM may feel a pull toward the cyberspace defense arena. It is at the beginning stages of his journeymenship (senior CW2 or junior CW3) where he may make the decision to move from the CyCM realm to the CyD realm. The decision point will normally be just prior to WOAC attendance. The expect

(Continued on page 28)

(Continued from page 27)

ed prerequisites for such a transition along with the planned board process are addressed in list article on page whatever.

Master Cyberspace Content Managers

Senior 255A (W4), having mastered applications, systems, and CyCM attributes move from the outer edges of the CyCM circle in the NetOps venn diagram, toward the center (See diagrams 1 and 2 on pages 24 and 25). They are now moving from mastery of one element toward the goal of W5 – mastery of NetOps in total. In accordance with DA Pam 600-3, the senior level 255A now adds such functions as "technical leader, sustainer, and advisor" to their list of duties and responsibilities.

Master CyCMs, as senior-level technical and tactical experts in their chosen field, have also gained familiarity with the other two elements of NetOps (i.e., CyNM and CyD). As they continue to develop as CW4 255A, they go beyond understanding the basic concepts of assured information delivery and assured information protection ensuring that these attributes of NetOps are obtained. While there is never an expectation of finger-pointing between the three associated skill-sets, the master CyCM takes ownership of these concepts and relationships (as do each of our Signal warrant officer MOSs) and in the absence of each sister MOS, takes charge. When all three MOSs are present, the conscious shared desire for synergy is the goal.

The master CyCMs are nominally assigned to a corps, ASCC, or higher level organization where their training and experience has its greatest impact. To prepare the CW4 255A for the duties and responsibilities encountered at these levels of organization, attendance at the Warrant Officer Staff Course is crucial.

The current WOSC includes a 41-hour self-paced course taught in the Blackboard learning content management system (web-based) designed to be completed over a 90-day period. It is designed to prepare future resident students for the core curriculum of the WOSC. The WOSC resident course provides instruction on tactical and operational scenarios in a joint, interagency, intergovernmental, and multinational environment with a strategic overview.

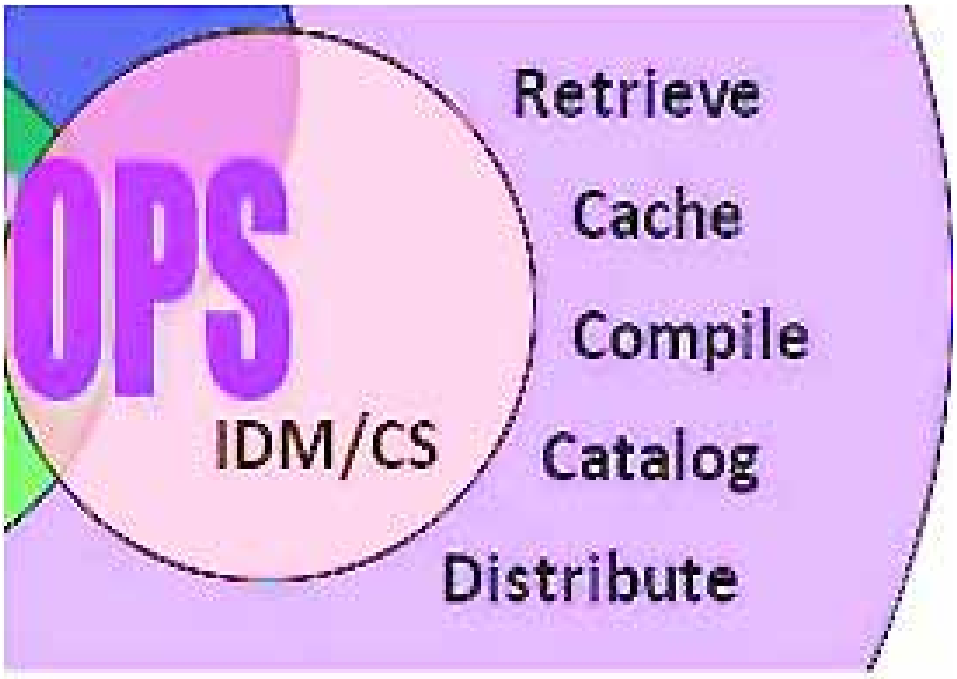

Diagram 4

History and battle analysis provides in-depth understanding of both the military decision making process and staff systems integrator-manager skills training and education. Knowledge management and project management with associated PEs are also introduced to reinforce the learning objectives. Assigned readings, an observation, insights and lessons learned paper as well as an MOS briefing must be completed to round out the course requirements. A recent decision to add functional branch training during this point in a warrant officer's career ensures maintenance of a solid tether to the advancements in the warrant officer's area of expertise.

A needed continuing education gap is being closed in the warrant officer corps. Because a warrant officer is authorized 30 years of service as a warrant officer, and should attend their Professional Military Education as early as possible, it was noted that with nominal WOAC attendance somewhere around the 5-6 year mark as a warrant officer, no further institutional branch/technical training would be provided for the remaining 24-25 years of WOS. Not willing to accept this, branches have been given approval to add such a functional branch training course subsequent to the WOSC. We are also investigating the necessity of a similar course following the Warrant Officer Senior Staff Course.

The currently planned WOSC follow-on course will be conducted similar to the Pre-Command Course. This five-week course will include as its foundation the Information Technology Infrastructure Library which is a set of concepts and practices for information technology services management, information technology development and IT operations. ITIL gives detailed descriptions of a number of important IT prac-

tices and provides comprehensive checklists, tasks and procedures that any IT organization can tailor to its needs. ITIL is published in a series of books, each of which covers an IT management topic. Also addressed are topics such as Army transformation, future Signal systems, LandWarNet architecture, enlisted MOS training, branch 25A and Functional Area 24A and 53A training. Since many of these officers will either arrive from or transfer to joint organizations, an up-to-date understanding of where the Army and the Signal Regiment is heading is absolutely necessary for the master CyCM to be fully successful.

The master CyCM continues to learn and grow in an area that never reaches a plateau. They, through their six-to-ten years of warrant officer service, continue to provide the Army and Department of Defense expert support to the ever critical IT systems which house and/or enable our nation's most lethal weapon systems. Just prior to promotion to CW5, the master CyCM is scheduled to attend the WOSSC. The current WOSSC includes a 47-hour course taught asynchronously in the Blackboard learning content management system (web-based) over a 60-day period. This course is not self-paced. Phase 1 (DL) asynchronous training consists of assigned professional readings, submission of two written papers, and participation in student to student, and student to instructor discussions. It is designed to prepare future resident students for the core curriculum of the WOSSC. Phase 1 (DL) must be completed prior to attending the Phase 2 resident course. The four-week Phase 2 (resident) course attended by the Army's most senior warrant officers provides senior CW4s or new CW5s with the master-level education, knowledge, and influential leadership skills necessary to apply their technical expertise in support of leaders on strategic level JIIM staffs during full spectrum operations. The curriculum focuses on topics relevant to today's Army such as staff skills, training doctrine, force integration, leader development, contemporary operational environment, insurgency, counterinsurgency, creative thinking, and critical thinking techniques.

Subsequent to promotion to CW5, the master CyCM becomes part of an ever smaller, elite group of Signal warrant officers, the Cyberspace Network Operations Technician, MOS 255Z. For further information on MOS 255Z, see the article on page 48 in this issue of the *Army Communicator* summarizing their career paths and describing their skills, attributes, duties, and responsibilities.

Join the Discussion
https://signallink.army.mil

Acronym QuickScan

ABCS – Army Battle Command System
AGDM – Average Grade Distribution Matrix
AOC – Area of Concentration
AODC – Action Officer Development Course
ASCC – Army Service Component Command
BCCS – Battle Command Common Services
BCT – Brigade Combat Team
CNA – Computer Network Attack
CND – Computer Network Defense
CNE – Computer Network Exploitation
CNO – Computer Network Operations
COMSEC – Communications Security
CyCM – Cyberspace Content Management
CyD – Cyberspace Defense
CyNM – Cyberspace Network Management
CyNOT – Cyberspace Network Operations Technician
DL – Distributive Learning
IA/CND – Information Assurance/Computer Network Defense
IDM/CS – Information Dissemination Management/Content Staging
IM/KM – Information Management/Knowledge Management
IP – Internet Protocol
IT – Information Technology
ITIL – Information Technology Infrastructure Library
ITSM – Information Technology Services Management
JIIM – Joint interagency intergovernmental and multinational
KM – Knowledge Management
LAN – Local Area Network
MOS – Military Occupational Specialty
NCO – Noncommissioned Officer
NCOER – Noncommissioned Officer Evaluation Report
NetOps – Network operations
OIL – Observation, Insights and Lessons Learned
PE – Practical Exercise
PME – Professional Military Education
PoP – Point of Presence
SME – Subject Matter Expert
SQL – Structured Query Language
STAMIS – Standard Army Management Information System
SysSME – Systems Matter Expert
TTP – Tactics, Techniques, Procedures
TWOS – Total Warrant Officer System
WOAC – Warrant Officer Advance Course
WOBC – Warrant Officer Basic Course
WOS – Warrant Officer Service
WOSC – Warrant Officer Staff Course
WOSSC – Warrant Officer Senior Staff Course