Chapter 1

Tactical Operations Center LAN Overview

Commanders depend on command and control (C2) systems to collect, combine, process, and exchange vital information needed to gain information dominance. The C2 systems in each tactical operations center (TOC) connect forming a local area network (LAN). These systems connected to the TOC LAN enhance C2 of the forces. This chapter gives an overview of a TOC, LAN, Army Battle Command and Control System (ABCS), Standard Army Management Information System (STAMIS), and data transport systems.

TOC

1-1. The TOC serves as the unit's C2 hub and assists the commander in synchronizing operations. Most of the staff coordination, planning, and monitoring of key events occurs at the TOC. Its personnel must ensure all resources are in the right place at the right time. They must function efficiently and effectively as a team in a fast-paced, unforgiving environment. All users, individually and collectively, must understand the overall function of the TOC. Basic TOC functions include–

- Receiving, distributing, and analyzing information.
- Submitting recommendations to the commander.
- Integrating and synchronizing resources.

1-2. The TOC functions primarily as an information center processing a high volume of message traffic, reports, and orders. It must act, direct, inform, and decide based on that information. An efficient TOC communicates internally and externally, and it integrates all its players. It is very easy for units to experience information overload unless they have simple and effective systems in place to receive and process information.

TOC LAYOUT

1-3. The physical layout of a TOC contributes to how efficiently information is passed from one staff section to another, and how easily sections communicate with one another. There is no standardized method on how a TOC should be configured. It is basically at the discretion of the individual unit. However, the most effective TOCs have the following factors in common:

- A high degree of organization.
- Configured in a manner that was functional to the unit and did not segregate staff sections.
- Planning areas were segregated from TOC briefing and operations areas.

1-4. Each TOC is configured differently depending on the unit's modification table of organization and equipment (MTOE) and mission. In each TOC, the different types of LANs vary as they depend on the mission, enemy, terrain, troops, time, and civilian consideration (METT-TC).

LAN

1-5. A LAN is a data communications network that interconnects a community of digital devices and other peripherals. These are linked over a network and are distributed over a localized area. The LAN consists of a communications channel that connects a series of computer terminals connected to a central computer or, more commonly, connects a group of computers to one another. Figure 1-1 shows an example of a LAN.

Figure 1-1. Example of a LAN

1-6. A LAN is connected by cables or by wireless technology. All Army LANs use the Institute of Electrical and Electronic Engineers (IEEE) 802.3/802.3u standard.

1-7. A LAN can be configured in a multitude of configurations depending on the unit's MTOE. A LAN includes–

- Digital devices (computers, scanners, printers, and other peripherals).
- A communications medium that exchanges data from one device to another.
- Network adapters that provide devices with an interface to the communications medium.
- A physical topology extending the medium between adapters.
- An access protocol carried out by the adapters to ensure an orderly use of the medium.
- A logical format for transmitting data over the medium.
- An electrical specification for data encoding and transmission.

1-8. Three common applications of a LAN are hardware, software, and information resource sharing. The communications resources of a LAN are shared among all devices attached to the network.

- Hardware resource sharing allows each computer on a network to access and use devices that are too costly to provide for each user or cannot be justified for each user because they are used infrequently.
- Software resource sharing involves storing frequently used software on the server's hard disk so multiple users can access the software on each computer.
- Information resource sharing allows anyone using a computer on a LAN to access data stored on any other computer in the network.

ABCS

1-9. ABCS integrates the five battlefield functional areas (BFAs) of maneuver, fire support (FS), air defense (AD), intelligence and electronic protect (EP), and combat service support (CSS). Whether deployed for land combat or conducting peace operations, ABCS supports the mission by integrating the automation and communications systems that link strategic and tactical headquarters.

1-10. ABCS is interoperable with joint and multinational C2 systems at upper echelons, and it is vertically and horizontally integrated at the tactical and operational levels.

BATTLEFIELD FUNCTIONAL AREA CONTROL SYSTEMS (BFACSs)

1-11. Integrating the BFACSs and the Force XXI Battle Command – Brigade and Below (FBCB2) system supports requirements at brigade and below for situational understanding (SU) and C2 data. Within this integration of systems, the force-level database first forms at the battalion to meet the tactical commander's requirements for the common picture and SU. The BFACSs are heavily oriented toward combat operations. Figure 1-2 shows the objective architecture of BFACSs.

1-12. The combined arms team commanders and staffs integrate and synchronize the BFAs to exercise force-level control (FLC). This is achieved by managing, manipulating, and assessing information from the BFAs and developing tactical plans and orders based on that information. FLC functions by providing automated support to the force commander and staff in planning, directing, coordinating, and controlling the combined arms team. FLC software supports the maintenance of force status, monitors the current situation, plans force missions, and controls FLC information transactions.

Maneuver Control System (MCS)

1-13. The MCS is the primary maneuver information system that allows the commander to collect, coordinate, and act on near-real-time battlefield information. The MCS quickly and accurately transfers tactical information and rapidly disseminates the commander's orders.

1-14. The database of the MCS maintains and displays critical and current information on friendly and enemy forces obtained from the BFACSs. This information is displayed in text and graphic formats. The commander and staff use common decision graphics for identifying possible courses of action. Commanders can make supporting decisions that mesh with the decisions and capabilities of other commanders.

Advanced Field Artillery Tactical Data System (AFATDS)

1-15. Fire missions flow through the FS chain where the most effective weapon system at the lowest echelon satisfies the target attack criteria. The AFATDS provides the automation that enables the maneuver commander to influence the battle. It provides the right mix of firing platforms and munitions to defeat enemy targets based on the commander's guidance and priorities. Also, the AFATDS facilitates the FS coordinator commander's ability to control assets and allocate resources.

1-16. Integrating all FS systems creates greater tactical mobility for FS units and allows missions to be planned and completed in less time using the best attack system to defeat a target. The AFATDS also meets field artillery needs by managing critical resources; supporting personnel assignments; collecting and passing intelligence information; and controlling supply, maintenance, and other logistics functions.

Figure 1-2. Objective Architecture of BFACSs

Air and Missile Defense Planning and Control System (AMDPCS)

1-17. The AMDPCS is an automated C2 system supporting AD operations within the battlespace. It controls and integrates AD engagement operations and combined arms force operations for the AD BFA. The system assists battle managers in planning, coordinating, synchronizing, directing, and controlling the counter air fight. It also assists the battle manager in developing and disseminating timely target data to all air and missile defense (AMD) components.

1-18. The AMDPCS responds to air attack threats by integrating targeting functions to support engagement operations. It acquires and tracks incoming air threats, identifies friendly and enemy aircraft, and automatically alerts forward AD weapons. To support force operations, the AMDPCS provides force-level commanders with the information to integrate AD into the overall tactical plan.

All Source Analysis System (ASAS)

1-19. The ASAS is a functionally integrated intelligence support system. It manages sensors and other resources and collects, processes, and fuses intelligence data. The ASAS stores, manipulates, and displays this data and quickly disseminates it to all commanders. This provides a common picture of enemy activity to the force-level database used by all BFAs.

1-20. The ASAS supports the commander's decision-making process. By facilitating the decision process, the ASAS allows the commander to generate opportunities to seize and to retain the initiative. The ASAS provides timely and accurate intelligence information that enables tactical commanders to maneuver inside the enemy's decision cycle and significantly enhances the interoperability and support of all BFAs.

Combat Service Support Control System (CSSCS)

1-21. The CSSCS is a logistics, supply, and administrative information system. It provides timely and critical information to strategic, operational, and tactical commanders. This system allows commanders to conduct trade-off analysis and to evaluate potential courses of actions based on different logistic scenarios.

1-22. The CSSCS serves as the interface with STAMIS and the other BFACSs. It consolidates detailed data from the STAMIS into decision support information for both CSS and force-level commanders.

FBCB2 System

1-23. The FBCB2 system consists of computing hardware (AN/UYK-128), system and application software, and installation kits. FBCB2 computers use tactical radio systems to link to the network. They use the variable message format (VMF) to send or receive messages, both horizontally and vertically in near-real time. The FBCB2 system exchanges information with the MCS, AFATDS, AMDPCS, ASAS, and CSSCS.

1-24. The FBCB2 system–

- Is user-owned and -operated.
- Improves combat effectiveness of the force.
- Provides up-to-date combat situation data such as friendly and enemy, air/ground unit position, and map/terrain/elevation data based on echelon and location.
- Generates and disseminates messages and acknowledgments such as orders and requests, fires and alerts, and reports.
- Generates and disseminates overlays on the situation posture such as intelligence, obstacle, operations, and control measures, and geometry data.
- Exchanges selected mission-critical data between the FBCB2 system and the other information systems semiautomatically.

STAMIS

1-25. The STAMIS provides the essential data needed to supply, resupply, requisition, and repair the Army's equipment. Each STAMIS is different and has requirements governing specific site location and operations. Many STAMIS software packages feed data to the Joint Chiefs of Staff (JCS)-level and are time critical in delivery and execution.

1-26. The Global Combat Support System-Army (GCSS-A) will be the Army's combat service supply system to modernize and integrate the capabilities of the existing STAMIS. The GCSS-A will integrate manning, arming, fixing, fueling, moving, and sustaining functions. This system will interface with other CSS automated systems so users can maximize the amount of information available with the minimum amount of data entry. It will be a commercial-off-the-shelf (COTS) hardware solution using the Windows New Technology operating system.

1-27. A brief description of each STAMIS application follows below.

DEPARTMENT OF THE ARMY MOVEMENT MANAGEMENT SYSTEM-REDESIGN (DAMMS-R)

1-28. The DAMMS-R provides automation support for transportation staffs and organizations within a tactical theater of operations. It supports transportation units within the continental United States (CONUS) and supports the Army's strategic mobility programs. It is a vital link in maintaining in-transit visibility over units, personnel, and materiel. DAMMS-R is the most complex of the retail STAMISs. DAMMS-R interfaces with all STAMISs, services, and foreign governments where the Army is deployed.

STANDARD ARMY AMMUNITION SYSTEM (SAAS)

1-29. The SAAS-modified provides centralized information management to support CONUS, overseas, and within the major commands.

STANDARD ARMY MAINTENANCE SYSTEM (SAMS)

1-30. The SAMS increases the productivity of maintenance shops, and it provides the commanders with accurate and timely maintenance management information. It operates in the direct support/general support (DS/GS) maintenance and/or aviation intermediate maintenance activity, the forward support battalion, main support battalion, corps support battalion, area support battalion, and the materiel management center (MMC) within division, corps, and echelons above corps (EAC) environments.

STANDARD ARMY RETAIL SUPPLY SYSTEM (SARSS)

1-31. The SARSS is a multiechelon supply management and stock control system that operates in tactical and garrison environments. It supports the STAMIS, SAMS-level 1, standard property book system-redesign (SPBS-R), unit-level logistics systems (ULLSs), nonautomated customers, and the split operations concept. Throughout the Army, SARSS is used in–

- DS and GS units' supply support activities (SSAs).
- Division MMCs.
- Armored cavalry regiments.
- Separate combat brigade MMCs.

SPBS-R

1-32. The SPBS-R provides on-line management information and automated reporting procedures for the property book officer and produces updated company-level hand receipts, when needed. It also provides automated interfaces with–

- SSAs for request and receipt of equipment.
- Continuing balance system-expanded for worldwide asset reporting.
- Logistics support activity for total asset visibility and catalog updates.
- Unique item tracking for weapons serial number tracking.
- Automated records management system for nondevelopmental item computer serial number tracking and warranty information.

ULLS

1-33. The ULLS is a standard, automated, logistics system for unit prescribed load list (PLL) and maintenance management operations. The ULLS automates repair parts, supply functions, maintenance management operations, aircraft records, and historical data. This automation improves accuracy and timeliness. The ULLS provides the tactical line companies and supporting CSS companies the capability to automate logistics at the unit level.

Unit Level Logistics System-Ground (ULLS-G)

1-34. Any unit that has an organizational maintenance facility has an ULLS-G. It automates vehicle dispatching, PLL management, and the Army Maintenance Management System. The ULLS-G interfaces with the SARSS-level 1, SAMS-level 1, ULLS-S4, vehicle sensors, and intervehicular information system. The automatic information technology interrogator is connected directly to the ULLS-G. It is linked to the wholesale supply system through objective supply capability.

Unit Level Logistics System-Aviation (ULLS-A)

1-35. All aviation units have an ULLS-A. It performs those functions for aviation that the ULLS-G performs for ground units.

Unit Level Logistics System-S4 (ULLS-S4)

1-36. Unit-level supply rooms and battalion and brigade level S4 staff sections have an ULLS-S4. It automates the supply property requisitioning/ document register process, hand/subhand receipts, component, budget, and logistical planning activities.

STANDARD INSTALLATION/DIVISION PERSONNEL SYSTEM-3 (SIDPERS-3)

1-37. SIDPERS-3 provides an integrated personnel support environment for the active Army. SIDPERS-3 consists of hardware, software, communications, and training that provides a minimum essential set of software applications to support a relational database. This database contains information about soldiers and units that commanders and staff officers use to properly manage the active Army force and maintain field personnel data in an automated form.

1-38. All decision-makers can use SIDPERS-3 to manage personnel assets in combat, meet mobilization contingencies, and achieve peace and wartime readiness goals. Through the Total Army Personnel Database (TAPDB), SIDPERS-3 indirectly interfaces with the Army Authorization and Documents System-Redesign. Also through the TAPDB, future interfaces may include the installation support module, the CSSCS, and the Reserve Component Automation System.

THEATER ARMY MEDICAL MANAGEMENT INFORMATION SYSTEM (TAMMIS)

1-39. TAMMIS can interface with other Department of Defense (DOD) management information systems and programs such as the Defense Medical Regulating Information System, SIDPERS, Prime Vendor Programs, Standard Financial System, and more.

1-40. TAMMIS automates communications by setting up a transmission schedule to remote locations and automating retransmissions. TAMMIS can relay information between units in various ways. The preferred methods use tactical terminal adapters, LAN, telephone lines, defense data networks, or an international maritime satellite using a commercial modem, stand-alone LAN, and floppy diskette or tape delivered by courier.

1-41. TAMMIS consists of six subsystems that support logistics and patient administration.

Logistics Subsystems

1-42. The subsystems supporting logistics are medical supply, medical assemblage management, and medical maintenance.

Patient Administration Subsystems

1-43. The subsystems supporting patient administration are medical regulating, medical patient accounting and reporting, and medical patient accounting and reporting-command and control.

DATA TRANSPORT SYSTEMS

1-44. Data is moved outside the LAN by accessing the data transport systems through a gateway. A gateway is a combination of hardware and software that allows users on one network to access the resources on a different network. The communications systems covered below can be used as data transport systems.

NOTE: The equipment available to a specific unit depends on the unit's mission and table(s) of organization and equipment (TOE).

COMBAT NET RADIO (CNR)

1-45. The CNR consists of the Single-Channel Ground and Airborne Radio System (SINCGARS), a tactical satellite (TACSAT) communications system, and high frequency (HF) radios. CNRs are the primary means of voice communications, but they can also transport data. CNRs are used in command, administrative/logistical, and intelligence/operations networks.

AREA COMMON USER SYSTEM (ACUS)

1-46. The ACUS is a communications system of network node switching centers connected primarily by line-of-sight (LOS) multichannel radios and TACSATs. Army ACUS networks include Tri-Service Tactical Communications (TRI-TAC) at EAC and mobile subscriber equipment (MSE) at echelons corps and below (ECB). The ACUS provides a multiuser, common-user area system for voice and data communications.

MSE

1-47. The MSE system is the primary ACUS configuration for ECB. MSE forms a network that covers the area occupied by unit subscribers. For a division, the grid is made up of four to six centralized node centers (NCs) These NCs make up the hub or backbone of the network. Throughout the maneuver area, subscribers connect to small extension nodes/large extension nodes (SENs/LENs) by radio or wire. These extension nodes serve as local call switching centers and provide access to the network by connecting to the NCs. The MSE system provides both voice and data communications on an automatic, discrete-addressed, fixed-directory basis using flood search routing. The system supports both wire and mobile subscribers.

Tactical Packet Network (TPN)

1-48. The TPN is overlaid on the MSE network and uses existing trunks exclusively for data transmission. Users can connect computers and LANs to the TPN from their command posts (CPs). The TPN breaks up data into packets and routes them along their most efficient path to their destination. When all packets arrive, the receiving packet switch reassembles the data and sends it to its destination.

ARMY DATA DISTRIBUTION SYSTEM (ADDS)

1-49. The ADDS is an integrated command, control and communications system providing near-real-time transmission capabilities to support low to medium volume data networks. The system automatically relays information from the origin to the destination transparent to the user. Subsystems are the Enhanced Position Location Reporting System (EPLRS) and the Joint Tactical Information Distribution System (JTIDS).

BROADCAST

1-50. Broadcast communications systems use technology similar to commercial radio stations. Transmit-only stations send information to HF radio systems, satellites, unmanned aerial vehicles, or other means. Weather, intelligence, and position location/navigation information get support from broadcast systems.

SATELLITE COMMUNICATIONS SYSTEMS

1-51. There are four segments to the military satellite communications (MILSATCOM) architecture. First, ultra high frequency (UHF) satellites are the workhorses for tactical ground, sea, and air forces. Second, the super high frequency (SHF) Defense Satellite Communications System (DSCS) supports long-distance communications requirements of military forces. The DSCS satisfies most DOD medium- and high data-rate communications requirements. The Military Strategic and Tactical Relay (MILSTAR) will soon be integrated as the third segment of the MILSATCOM architecture. It will provide a worldwide, secure, jam-resistant communications capability to US civilian and military leaders for C2 of military forces. The fourth segment consists of commercial communications satellites, which are used to support DOD's MILSATCOM.

DEFENSE DATA NETWORK (DDN)

1-52. The DDN is a global communications network serving DOD. The DDN consists of military networks, portions of the Internet, and classified networks (which are not part of the Internet). The Defense Information Systems Agency (DISA) manages the DDN.

DEFENSE INFORMATION SYSTEMS NETWORK (DISN)

1-53. The DISN is a worldwide information transfer infrastructure. It consists of backbone, regional, and local components intended to support the DOD. The DISN provides sufficient value-added common user services and bandwidth for the high-volume exchange of voice, data, imagery, and video communications anywhere in the world. Its capabilities include–

- The long-haul transport component of the defense information infrastructure (DII).
- Providing seamless interoperability and assured connectivity.
- Providing positive control of network resources.
- Incorporating emerging technology, as it becomes available.

As a subset of the DII, the DISN provides switching and transmission within and across DII boundaries.

AUTOMATIC DIGITAL NETWORK (AUTODIN)

1-54. The AUTODIN currently provides all levels of message security classification services worldwide. AUTODIN is interconnected through a network of AUTODIN switching centers located within the CONUS and around the world. AUTODIN is an integrated multilevel secure network that supports the exchange of general service narrative, data pattern, and Defense Special Security Communications System (DSSCS) messages. These messages range from unclassified to Top Secret/Special Category Information (TS/SCI).

DEFENSE MESSAGING SYSTEM (DMS)

1-55. The Defense Message System (DMS) is a new way of doing electronic organizational messaging. DMS eliminates the need for AUTODIN and legacy electronic mail (e-mail) systems throughout DOD's Internet protocol (IP) router network and associated LANs. DMS is a flexible, secure, COTS-based system. It provides multimedia messaging and directory services that take advantage of the underlying DII network and services. The DMS will handle information of all classification levels, compartments, and handling instructions. DMS is an integrated suite of applications that run on the DISN. DMS is NOT a network and is the system of record for organizational messaging.