The purpose of this blended distance learning course is to provide military and civilian personnel supporting NATO CIS Communication Services with the fundamental knowledge and practical skills required to integrate, and securely operate, maintain and troubleshoot the basic technology supporting NATO Communication Services, as specified in the NATO Consultation, Command and Control (C3) Taxonomy in federated mission networks. These Communication Services include Transmission, Transport, and Communications Access Services in modern, converged Packet- and Frame-based networks.

Students explore how Deployable CIS (DCIS) supports the extension or deployment of intra-node and basic inter-node Communication Services (ComS) up to the scope of a Minor Point of Presence (PoP). Students acquire knowledge and skills required on future courses for capabilities and systems supporting these services. This course introduces NATO-specific Line of Sight (LOS) and Beyond Line of Sight (BLOS, such as Satellite Communications - SATCOM) Transmission Services. Further detail is given on the appropriate Transmission Services courses.

This course is a Foundation category course in the DCIS Training Framework, as illustrated, below; it serves as pre-requisites for a variety of courses:
This theory and practical simulation-based skill focussed course (twinned with the mandatory companion course NCISS Course 967) will provide the most cost-effective and efficient blended learning experience. The face-to-face nature of this course pair enables human networking between operators and maintainers.

Successful students will be prepared for an equivalent of the Cisco Certified Networking Entry-Level Network Technician (CC-ENT) level, the exam for which is not included in the course. Students may continue the training path to Deployment Training or System Level courses of the aforementioned PoP size. Students requiring more in-depth knowledge and skills on inter-node Communication Services supporting a larger PoP continue to follow-on courses will have to attend the courses 966 and 968 equivalent to the Cisco Networking Associate (CCNA) Routing and Switching (CCNA R&S)) as illustrated, below:
Given the pre-requisites specified in paragraph 16, upon completion of the course, the student is prepared for NCISS Course 967 and will be able to:

- Explore NATO networks and Architectures as globally connected, consisting of local and wide area networks (LAN and WAN).
- Describe the devices and services used to support communications in changing NATO data packet-based network environments.
- Assess the purpose and importance of NATO networks and devices supporting the Internetwork Operating System (IOS), and use available interfaces to configure devices.
- Explain the purpose and role of protocol suites, models, and standards in packet based networks. The student explores and explains how data is transported across local and remote networks to, and from, resources supporting services.
- Identify, describe, select, and simulate connecting media types used in NATO Transmission Services, based on introduced topologies for wired LAN and WAN Services and explore wireless networks.
- Describe the characteristics of media access methods, controls, and types.
• Identify and describe fundamental Ethernet operations, addressing and address resolution concepts, and compares and configures local Distribution Service devices, such as a switch.

• Describe, explain and compare frameworks and concepts used in Transmission, Transport, and Packet-based Communication Access Services.

• Configure Communication Service devices, such as routers and switches.

• Explain and describe addressing and delivery methods used in NATO Transport and Communication Access Services.

• Determine the best suited protocols based on service requirements, such as reliability.

• Compare and explain current addressing schemes used in NATO Packet-based Communication Access Services.

• Configure networking devices and use common utilities to test connectivity.

• Describe the basic concepts of addressing and network separation in NATO Packet-based Transport and Communication Services.

• Design, implement, and calculate addressing schemes as directed.

• Explain and describe the functions and protocols moving data across NATO networks, using Communication Service protocols and services that support NATO Core Enterprise and Community of Interest Services (CES and CoI).

• Identify, explain and describe NATO Communication Service implementations in small and larger networks as well as security vulnerabilities and mitigation.

• Configure network devices, to include hardening, back-up and restore features and conducts basic verification and troubleshooting commands.

• Note: A practical and theory practice exam will be administered, online, between the above first and the below second module.

• Describe technology convergence and related Frame-based Access Service on switched NATO Wired Local Area Transmission Services and networks.

• Compare and contrast Frame- and Packet-based terminology and concepts in Local Area networks.

• Apply initial configurations to virtual and physical Local Area Transmission Service components, and ensure Information Assurance measures are applied.
• Describe and apply redundancy and Information Assurance mechanisms, protocols, and configurations in virtual NATO Local Area Transmission Service networks.

• Explain and apply routing concepts in Communication Access and Transport Service network devices, such as routers; establish connectivity between those devices and apply basic configurations.

• Examine, explain, and apply cost-effective virtual Local Area Transmission, Transport and Access Service routing (static and dynamic) concepts and complete and troubleshoot configurations on routers and switches.

• Compare, contrast, explain and configure legacy, current, and near-future Packet-based Access Service routing protocols and addressing schemes.

• Examine, calculate, apply and troubleshoot efficient address management schemes used in Communication, Core Enterprise, and Community of Interest Services.

• Analyse, compare and explain benefits of dynamic protocols against static configurations that are both used in Communication Services across NATO.

• Accurately interpret and compare protocol standards and tables that may be found in NATO Partners’ networks with those used in NATO appreciating benefits and disadvantages.

• Examine in depth the main Packet-based routing protocol used in NATO Communication and other Services. Using the common user interface, apply and verify configurations that include both current and near-future addressing and network design schemes.

• Analyse, assess, configure and modify Information Assurance and Service Management and Control tools used in NATO, such as access control lists, and distinguish current and near-future addressing scheme implications.

• Explain, configure and troubleshoot current and near-future Packet-Based Services protocols that assist operators in establishing automatic address configuration of end-user and other equipment in networks.

• Describe, configure and verify Edge and Core Transport Service supporting mechanisms, such as address translations found between networks of different authorities (e.g. NATO and Partners).
Note: A practical and theory practice exam will be administered, online, that sums up this second module.

5. Qualification

This course does not qualify students by itself. Successful students are eligible to and must proceed to NCISS Course 967 to gain the qualification.

6. Student Criteria

A student will be accepted on the course if they meet all of the following requirements:

1. Be assigned to a NCS or NFS HQ or unit where the relevant NATO DCIS Services will be employed on operations and / or exercises.
2. Met the background knowledge prerequisites for this course.

7. Rank

- Officer
- Non-Commissioned Officers (NCO) and Senior NCO involved in DCIS
- Civilian equivalent

8. Language Proficiency

According to STANAG 6001: English SLP 3332

9. Security Clearance

NATO Unclassified (note that for the follow-on course a NATO Secret Clearance is required).

10. Course Length

The course is a self-study, instructor-facilitated course, but limited to a maximum of six (6) weeks, based on two online modules of 11 chapters each (that include theory or skills assessments). Practice Assessments for each module for theory and practical skills are included. Proctored Final Exams for both will be conducted during the face to face course.
Customer units may request shorter duration courses following the established procedures (a duration of 3-5 weeks is feasible, but may provide less retention value for the students).

The course will be followed by a face-to-face course (NCISS Course 967) at NCISS Latina.

Course chapters and modules are of various lengths; students and their supervisors should expect a minimum of four (4) to six (6) hours course work per day; this time might vary based on language and other knowledge and skills students already have.

11. Special Instructions

Training Coordinators and student supervisors need to ensure that students can attend both this and the mandatory following course.

Students shall attend the companion course with the same iteration number. Training coordinators need to ensure students can attend both courses as scheduled.

The students are working online, using the Cisco online learning environment provided by the NCISS Cisco Academy.

Hardware and software for this course will not be provided by NCISS. Students will require access to the Internet, and the below listed minimum hardware and software:

- A computer (for online content and practical exercises) or tablet (online content, only) with Internet connectivity; the computer must meet minimum pre-requisites for installing the Cisco network simulation software (Cisco Packet Tracer).
- Internet access throughout the course duration.
- An up-to-date and patched browser software as of the Cisco Networking Academy platform requirements (available on www.netacad.com).

Students not meeting the assignment and background knowledge criteria may attend ONLY with the explicit recommendation of the NCI Agency Network Services and IT Infrastructure (NS & II) Service Line, DCIS Service Delivery Manager, provided they have met the security clearance requirement.

12. Class Size (Maximum/Recommended/Minimum)

8/6/4
13. Nomination Procedure

Upon registration as specified on [www.nciss.nato.int](http://www.nciss.nato.int) students are recommended to add an e-mail account they could access after duty hours to the Comment field of the Joining Report.

14. Pre Course Study Material

- None

15. Location

The course is conducted online Cisco online learning environment provided by the NCISS Cisco Academy under [www.netacad.com](http://www.netacad.com).

16. Background Knowledge Prerequisites

**Essential Prerequisites:**

- The students must have basic computer skills including the use of mouse, and keyboard.
- The students must be familiar with the use of a graphical user interface (GUI) such as Microsoft Windows™.
- The students must be familiar with the use of modern and current web browsers (recommended Internet Explorer / Edge or Chrome).
- Students must have fundamental mathematical and problem solving skills.
- Students must be able to attend the mandatory follow-up course.

**Desirable Prerequisites:**

- N/A