

HQ Supreme Allied Commander Transformation  
**RFI-ACT-SACT-23-29**

Headquarters Supreme Allied Commander Transformation Norfolk Virginia



REQUEST FOR INFORMATION  
RFI-ACT-SACT-23-29

This document contains a Request for Information (RFI) call to industry, academia and nations for their input to NATO's requirement for testing the implementation and performance of 5G over Non-Terrestrial Networks (NTN).

Industry, academia and nations wishing to respond to this RFI should read this document carefully and follow the guidance for responding.

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HQ Supreme Allied Commander Transformation RFI 23-29 General Information	
Request For Information No.	23-29
Project Title	Request for industry input to NATO's Requirement for Testing the Implementation and Performance of 5G Over Non-Terrestrial Networks (NTN).
Due date for questions concerning related information	<b>5:00 pm EDT 10 April, 2023</b>
Due date for submission of requested information	<b>5:00 pm EDT 30 April, 2023</b>
Contracting Office Address	NATO, HQ Supreme Allied Commander Transformation (SACT) Purchasing & Contracting Suite 100 7857 Blandy Rd, Norfolk, VA, 23511-2490
Contracting Points of Contact	Ms Magdalena Ornat Email: <a href="mailto:magdalena.ornat@act.nato.int">magdalena.ornat@act.nato.int</a> Tel: +1-757-747-3150  Ms Tonya Bonilla E-mail: <a href="mailto:tonya.bonilla@act.nato.int">tonya.bonilla@act.nato.int</a> Tel: +1 757 747 3575  Ms Catherine Giglio E-mail: <a href="mailto:catherine.giglio@act.nato.int">catherine.giglio@act.nato.int</a> Tel:+1 757 747 3856
Technical Points of Contact	1. Mr. Warren Low, e-mail : <a href="mailto:warren.low@act.nato.int">warren.low@act.nato.int</a> Tel : +1 757 747 4203  2. Luc Barbeau, e-mail : <a href="mailto:luc.barbeau@act.nato.int">luc.barbeau@act.nato.int</a> Tel: +1 757 747 3143
References	<b>A.</b> <i>Building a 5G Non-Terrestrial Network using Open Air Interface Open-source Software</i> , Florian Kaltenberger, Thomas Schlichtery, Thomas Heyny, Guido Casatiy, Florian Volkz, Robert T. Schwarz, and Andreas Knoppz, 2021.  <b>B.</b> <i>5G &amp; Non-Terrestrial Networks White Paper, 5G Americas, February 2022</i>
All request for clarifications and responses to this RFI must be sent via email to all Points of Contact reported above.	

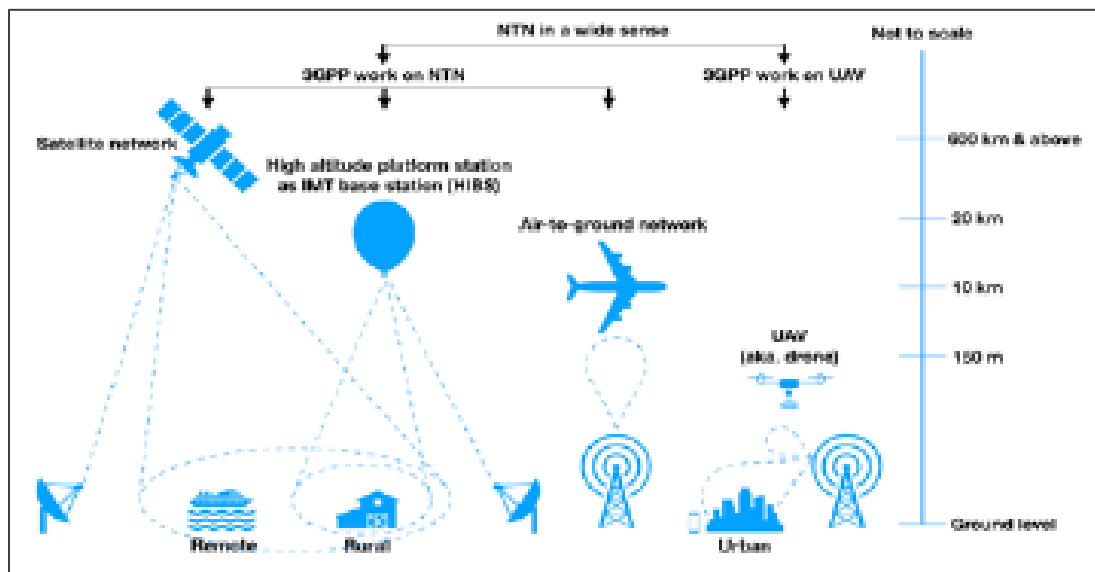
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## 1. INTRODUCTION

**Summary.** Headquarters Supreme Allied Commander Transformation (HQ SACT) is issuing this Request for Information (RFI) in order to engage with industry. The intention is to inform the future implementation strategies and requirements of NATO 5G technologies, networks and services over NTN in support of a number of use cases (see section 3.3).

**This Request for Information (RFI) does not constitute a commitment to issue a future request for proposal (RFP).** The purpose of this request is to involve industry through collaboration, in an examination of future capabilities related to the implementation of 5G services. The focus is on what are the technical challenges and implementation requirements to achieve an acceptable level of performance of 5G services over NTN and specifically satellite communications (SATCOM). However, this can also be implemented using other Beyond Line of Sight capabilities such as High Altitude Platform Systems (HAPS)/High IMT Base Stations (HIBS), UAVs or Air-to-Ground networks.



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Further, respondents are advised that HQ SACT will not pay for any information or administrative costs incurred in responding to this RFI. The costs for responding to this RFI shall be borne solely by the responding party. Not responding to this RFI does not preclude participation in any subsequent RFP if issued in the future. All information shared with ACT might be shared with contracted third parties in order to support the capability development process as needed. Provision of data, or lack of, will not prejudice any respondent in the event that there is a competitive bidding process later as part of NATO Common-Funded Capability Development.

**2. DESCRIPTION of the Capability – 5G Over Non-Terrestrial Networks**

**2.1. Background**

NATO is currently experimenting with the implementation of 5G technologies, networks and services to test and evaluate its potential for support of NATO operations and inform future capability development with implementation requirements.

This is not a formal request for submissions as part of a procurement effort; the intention is to conduct an additional in-depth assessment of 5G over NTN to determine the potential utility for NATO.

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**2.2. Aim**

To assess and evaluate potential implementation strategies and technical requirements/architectures for 5G technologies, networks and services over NTN that may be demonstrated during a NATO 5G-Technology demonstration in late October 2023.

**2.3. Use Cases**

During a NATO 5G-Technology Demonstration event later in 2023, NATO plans to implement 5G over a NTN (SATCOM) with details as follows:

- Location will be in Europe, most likely in Germany (Wessel) or the Netherlands (Brunssum), requiring SATCOM coverage in those locations; and
- It will involve NATO's Communications and Information Systems Group (NCISG) and one of their Signal Battalions;
- NATO's deployable communication equipment; and
- End- User equipment, that would include mobile phones and tablets, connected to other user devices that provide voice, data and video traffic.

The demonstration will focus on use cases described in the following table:

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5G Use Case	Description	Satellite Service Required
Mobile / On-The-Move (OTM) Connectivity	Users on board maritime vessels, aircraft or land vehicles need to access 5G services and benefit from high data rates/capacity	Broadcast connectivity between the Core network and the nodes on a moving platform
Direct 5G end-user equipment connectivity	NATO deployed forces, medical personnel, etc. can exchange (instant) messaging and voice services in deployed operations and outdoor conditions and achieve continuity of communication services anywhere they are deployed.	Space-Based access to 5G enabled user equipment e.g. smart phone, tablet, handset, tactical radio, etc.  Including Space-Based 5G Cell Tower Provider to Mobile Network Operators (LEO based satellites)  <i>(May be implemented via a L-Band connection at 100++ kbps)</i>
Reach-Back Connectivity from deployed 5G nodes (gNB)	NATO deployed units/HQs may want to interconnect various deployed 5G local networks with a strategic NATO data network	Broadband connectivity between the strategic NATO data network and a 5G (gNB) mobile network anchor point or between the anchor points (gNBs) of two 5G deployed/mobile networks.  See Figure 2 - NATO router connects through a SATCOM terminal (Commercial VSAT or NATO owned - indirect) providing 5G access through a SATCOM feeder link to reach-back 5G gNB and then into the 5GC (data network)
Local Area IoT Service	Group of sensors that collect local data, connect to each other and report to a central point. The central point e.g. Operations Center may also take local actions based on the IoT sensor data.	Connectivity between mobile core network and base station serving IoT devices in the local area of operations

Table 1: NATO Use Cases for 5G Over NTNs

**2.4. Examples of Expected Operational Architectural Views – Level 1 (OV-1)**

Expected input to this RFI is the respondents' implementation concept for 5G over NTN to help NATO plan and design its 5G-Technology Demonstration, helping NATO evaluate this new technology / paradigm. An example of the type of technical OV-1 architecture views we would expect to see and the specific implementation details by respondents are as follows:

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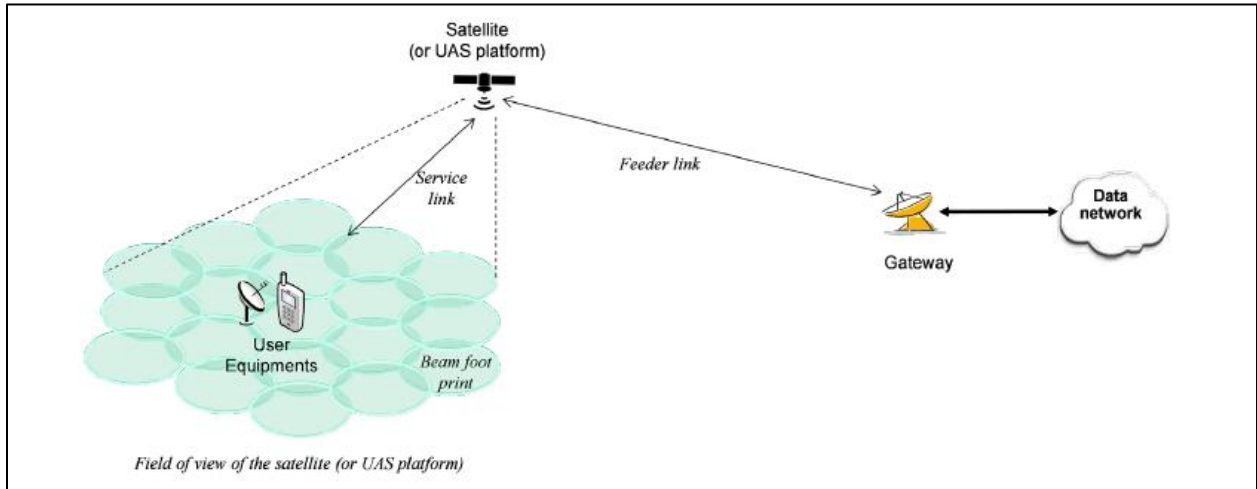


Figure 1: OV-: 5G Over Transparent Satellite (Reference B)

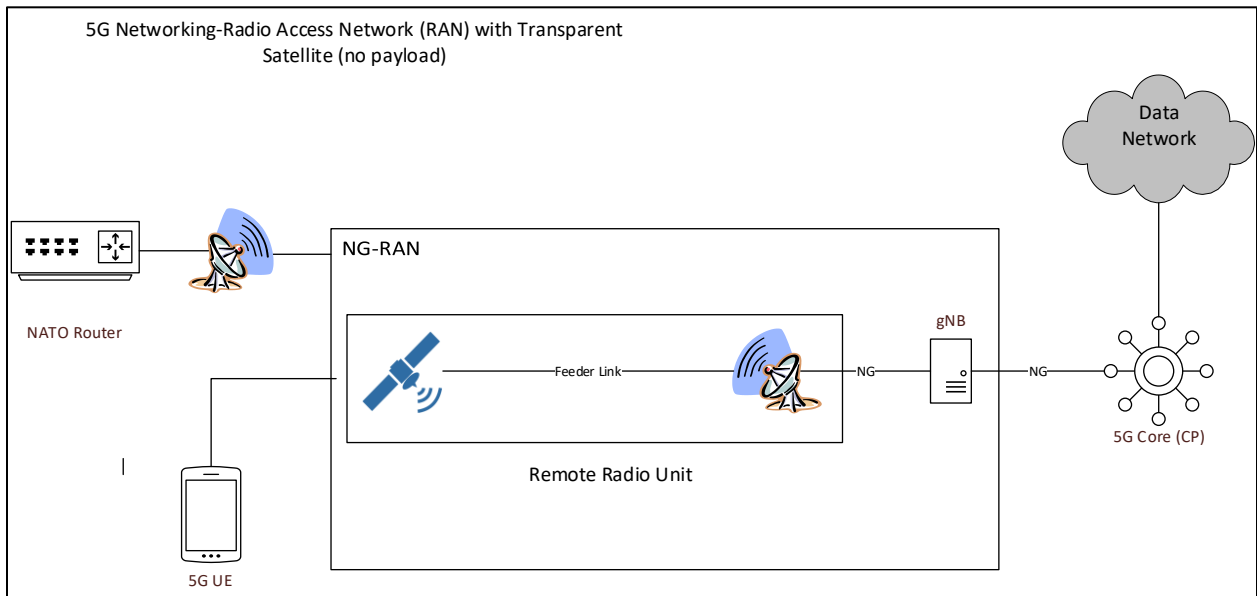


Figure 2: Example of 5G RAN with Transparent Satellite (Reference B)

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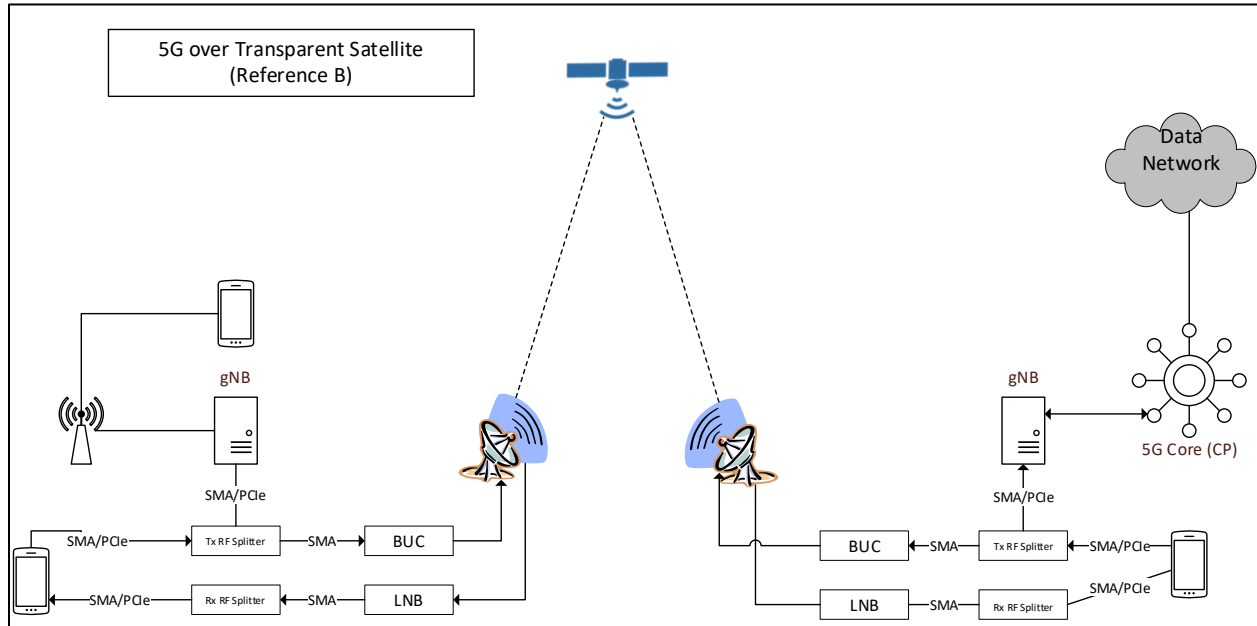


Figure 3: Building a 5G Non-Terrestrial Network using OpenAirInterface Open-Source Software (Reference A)

### 3. Requested Information and Response Guidelines

The response(s) to this RFI must be submitted by e-mail. Submissions to include both the Technical and Contracting POCs listed on page 2. The responses shall not contain any classified information. HQ SACT reserves the right to seek clarification on submissions.



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**3.1. Responses to the RFI.**

**3.1.1. Structure of Response**

- Provide name, mailing address, overnight delivery address (if different from mailing address), designated point of contact (phone number, e-mail).
- Respondents can collaborate with other providers, but all companies/organizations must be clearly identified and their role/services clearly stated.
- Response should include at a minimum a technical description and technical architecture diagram (like the ones provided in section 3.5) of the proposed implementation. Responses are not required to follow any format, but the following is proposed:
  - a. Introduction
  - b. Assumptions
  - c. Technical / System Requirements
  - d. Description of Network Implementation & Architecture Views
  - e. Recommendations
- Identify current services your company offers which most closely match the capabilities specified in this RFI (or portions of).
- Available product brochures, specification sheets, photographs, illustration and technical descriptions that describe your company's current services are welcome. Companies are encouraged not to include marketing informational materials that do not relate to the services described in this RFI as it will be discarded; however, responses may include URL links to technical documentation materials (i.e., technical data sheets for products) are welcome.
- Response limited to a single main document and enclosures for a total not-to-exceed 10 pages (material provided as per paragraph above not included).
- The document should be single-spaced, have one-inch margins, assume US letter-size (8 1/2 by 11 inches) page, use 12-point font, and be formatted for compatibility with Microsoft Word or Adobe Acrobat Reader (current versions).
- Submissions should be named according to the following convention: <Respondent company name; maximum of 12 characters>\_COMSATCOM RFI\_<date in YYYYMMDD format>.<filename extension of 3 or 4 characters>. Provide list of your company's past and current customers to which you have provided or are providing similar services, including a customer/company name and point of contact, phone number, and address/e-mail where they can be contacted.

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- Responses shall not be classified above the level of NATO UNCLASSIFIED.
- Submissions must be received no later than **30 April 2023, 5:00 PM, Eastern Daylight Time, Norfolk, Virginia, USA**

#### **4. Clarifications and Questions**

Inquiries of a technical nature about this RFI shall be submitted by e-mail solely to the aforementioned POCs by **10 April, 2023, 5 PM, Eastern Daylight Time, Norfolk, Virginia, USA**. Accordingly, questions in an e-mail shall not contain proprietary and/or classified information. Answers will be posted as soon as possible on the HQ SACT P&C website at: <https://act.nato.int/contracting>.

#### **5. Organizational Conflicts of Interest.**

As contracting involves the expenditure of funds allocated by the member nations, we must always strive to maintain trust in and preserve the integrity of this Headquarters' procurement procedures. It is essential that our procedures facilitate transparent and robust competition from industry.

Contractor and subcontractor personnel performing work under an HQ SACT contract may receive, have access to, or participate in the development of sensitive information relating to source selection methodology, cost or pricing information, budget information, and future specifications, requirements or Statements of Work or perform evaluation services that may create a current or subsequent Organizational Conflict of Interests (OCI). Similarly, companies responding to an HQ SACT RFI may create a subsequent OCI determination when pursuing future NATO contracts generated from that RFI.

Each individual contracting situation will of course be examined on the basis of its particular facts and the nature of any proposed contract. . The exercise of common sense, good judgment, and sound discretion is required in both the decision on whether a significant potential conflict exists and, if it does, the development of an appropriate means for resolving it.

In anticipation of a future OCI determination, any company either awarded an HQ SACT contract or responding to an HQ SACT RFI while also anticipating bidding on future NATO contracts relating to this work, should consider having a mitigation plan in place to address or mitigate any OCI concerns now or in the future.

#### **6. Handling of Proprietary information.**

Proprietary information, if any, should be minimized and clearly marked as such. HQ SACT will treat proprietary information with the same due care as the command treats its own proprietary information. HQ SACT will exercise due care to prevent its unauthorized disclosure. Please be advised that all submissions become HQ SACT property and will

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not be returned.

**7. Non-disclosure principles and/or nondisclosure agreement (NDA) with third party company.**

HQ SACT will follow non-disclosure principles and possibly conclude an NDA with any companies to protect submitted information from further disclosure. As the third party beneficiary of this nondisclosure, this RFI serves to inform you of how HQ SACT plans to proceed and of HQ SACT's intent to protect information from unauthorized disclosure, requiring the third party company to protect the disclosed information using the highest degree of care that the company utilizes to protect its own Proprietary Information of a similar nature, and no less than reasonable care. This includes the following responsibilities and obligations:

The third party company receiving the information shall not, without explicit, written consent of HQ SACT:

- Discuss, disclose, publish or disseminate any Proprietary Information received or accessed under nondisclosure principles and subject to an NDA, if an NDA is concluded;
- Use disclosed Proprietary Information in any way except for the purpose for which it was disclosed in furtherance of the goals of the instant project, collaboration, activity or contract; or
- Mention the other Party or disclose the relationship including, without limitation, in marketing materials, presentations, press releases or interviews.

**8. Exceptions to Obligations**

The third party company receiving the information may disclose, publish, disseminate, and use Proprietary Information:

- To its employees, officers, directors, contractors, and affiliates of the recipient who have a need to know and who have an organizational code of conduct or written agreement with the recipient requiring them to treat the disclosed Proprietary Information in accordance with nondisclosure principles and the NDA (if executed);
- To the extent required by law; however, the company receiving the information will give HQ SACT prompt notice to allow HQ SACT a reasonable opportunity to obtain a protective order or otherwise protect the disclosed information through legal process; or

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- That is demonstrated in written record to have been developed independently or already in the possession of the company receiving the information without obligation of confidentiality prior to the date of receipt from HQ SACT; that is disclosed or used with prior written approval from HQ SACT; obtained from a source other than HQ SACT without obligation of confidentiality; or publicly available when received.

Any response to this RFI is considered to establish consent to this process. A copy of the NDA, if or when concluded, can be provided on request.

**9. Questions**

Questions of any nature, including technical ones, about this RFI announcement shall be submitted by e-mail solely to the contracting and technical POCs. Accordingly, questions in an e-mail shall not contain proprietary and/or classified information. Answers to questions will be posted, for everyone's awareness, on the HQ SACT P&C website at: [www.act.nato.int/contracting](http://www.act.nato.int/contracting).

**10. Summary.**

**This is a RFI only.** The purpose of this RFI is to involve industry, academia and nations through collaboration, for their input to NATO's requirement for testing the implementation and performance of 5G over Non-Terrestrial Networks (NTN). HQ SACT has not made a commitment to procure any of the items described herein, and release of this RFI shall not be construed as such a commitment, nor as authorization to incur cost for which reimbursement will be required or sought. It is emphasised that this is a RFI, and not a RFP of any kind. All responses to this RFI should be received no later than **30 April 2023**.