Request for Information (RFI)

SANReN Student/Researcher Wireless Network Connectivity

RFI No. 7036/10/03/2023

Date of Issue	Friday, 03 February 2023	
Non-compulsory briefing session	Monday, 27 February 2023 Time: 10:00 – 13:00 on MS teams Link: See link on page 12 of 15	
Closing Date	Friday, 10 March 2023 at 16:30	
Place for submission of RFI proposals	Online only submission at tender@csir.co.za If the size of the documents exceed 30MB, send multiple emails. Use the RFI number and description as the subject on the email.	
Enquiries	Strategic Procurement Unit	E-mail: tender@csir.co.za
CSIR business hours	08h00 – 16h30	
Category	ICT Services	

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Glossary

Abbreviation	Term	Description
APN	Access Point Name	An APN is the name of a gateway between a mobile network and another computer network, frequently the public Internet.
CSIR	Council for Scientific and Industrial Research	A statutory body established in terms of Scientific Research Council Act 46 of 1988, as amended
DSI	Department of Science & Innovation	South African government department responsible for scientific research programmes
GSM	Global System for Mobile communications	A standard developed to describe the protocols for second generation digital cellular networks used by mobile devices
MNO	Mobile Network Operator	A provider of wireless communication services
MSISDN	Mobile Subscriber ISDN Number	MSISDN is a number uniquely identifying a subscription in a GSM or a UMTS mobile network
NICIS	National Integrated Cyber-Infrastructure System	A Centre of the Department of Science and Innovation hosted by the CSIR. NICIS = SANReN + CHPC + DIRISA
RFI	Request for Information	A process for gathering information from potential suppliers of a product or service

Abbreviation	Term	Description
SAFIRE	South African Identity Federation	Academic identity federation for research and education institutions. See https://safire.ac.za/
SANReN	South African National Research Network	The South African National Research Network (SANReN) is a high-speed network dedicated to science, research, education and innovation traffic.
SIM card	Subscriber Identity Module	A SIM card is an integrated circuit intended to securely store the international mobile subscriber identity number and its related key, which are used to identify and authenticate subscribers on mobile telephony devices.
UMTS	Universal Mobile Telecommunications System	Third generation mobile cellular system for networks based on the GSM standard

1 INTRODUCTION

The Council for Scientific and Industrial Research (CSIR) is one of the leading scientific research and technology development organisations in Africa. In partnership with national and international research and technology institutions, CSIR undertakes directed and multidisciplinary research and technology innovation that contributes to the improvement of the quality of life of South Africans. The CSIR's main site is in Pretoria while it is represented in other provinces of South Africa through regional offices.

The National Integrated Cyber-Infrastructure System (NICIS) is, a unit within the CSIR, responsible to provide integrated Cyber-Infrastructure in the form of a high-speed network, large-scale processing capacity and long-term data storage system to research and higher education communities in South Africa. NICIS provides these services through the Centre for High-Performance Computing (CHPC), the South African National Research Network (SANReN) and the Data Intensive Research Initiative of South Africa (DIRISA) units.

2 BACKGROUND

2.1 The South African National Research Network

The South African National Research Network (SANReN) is a major research infrastructure initiative of the Department of Science and Innovation with the responsibility to connect all research, higher education and innovation institutions to a high-speed telecommunications network.

The SANReN network currently has several backbone links, regional and metropolitan links providing network connectivity to qualifying research and education institutions. The changing nature of the research and education environment means that a significant amount of teaching and research work happens remotely leaving a significant number of students and researchers with inadequate internet connectivity and unable to benefit from the SA NREN network. There are currently other solutions to reach students and researchers through wireless solutions/products like eduroam (https://eduroam.ac.za/). This proposed solution seeks to complement eduroam by extending the availability and access to the SA NREN network to everywhere there is mobile network presence. Therefore, the reach of the mobile network operators makes them an ideal partner(s) to carry this research and education traffic.

The CSIR has been issued with a Licence Exemption in terms of the regulations for Licence exemption as defined in the Electronic Communications (EC) Act no 36 of 2005, for the establishment of SANReN. This licence exemption entitles the CSIR to build and acquire its

own communications infrastructure, or to lease connectivity and capacity from licensed telecommunications operators holding ECNS licences issued in terms of the EC Act.

This document describes the general terms and conditions to which all respondents must comply.

3 CSIR UNDERTAKING

The CSIR undertakes not to share any information submitted in terms of this RFI with alternative mobile network operators and any other parties outside the CSIR or its partner organisation(s). The information obtained will be used solely for this RFI and to inform the CSIR of the technical and supplier alternatives available for the provisioning of the mobile network-based internet connectivity solution for the research and education community of South Africa. The information provided will be treated as confidential and will not be made available to other organisations and/or persons not directly involved with the CSIR.

4 REQUIREMENT LEVEL KEYWORDS

To eliminate ambiguity, respondents are to interpret the meaning of technical requirements using the keywords; "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional", as defined by the IETF RFC (Request For Comments) document designated as RFC2119. A copy of RFC 2119 is attached as Annexure J - RFC 2119.

5 REQUEST FOR INFORMATION

SANReN is seeking information on the possible solutions that can provide the reach and means to connect the research and education community to the SANReN network via the mobile (3G/4G/5G) network in South Africa. Furthermore, interested parties are requested to provide budgetary pricing information on the solution(s). The submitted information is explicitly based on the conditions and specifications herewith. This received budgetary pricing information will assist SANReN to decide on how to proceed going forward in the design, development and/or procurement of the solution.

The SANReN team is proposing a solution based on an Access Point Name (APN) technology, however, suppliers are also encouraged to propose other solutions.

6 SANREN PROPOSED SOLUTION

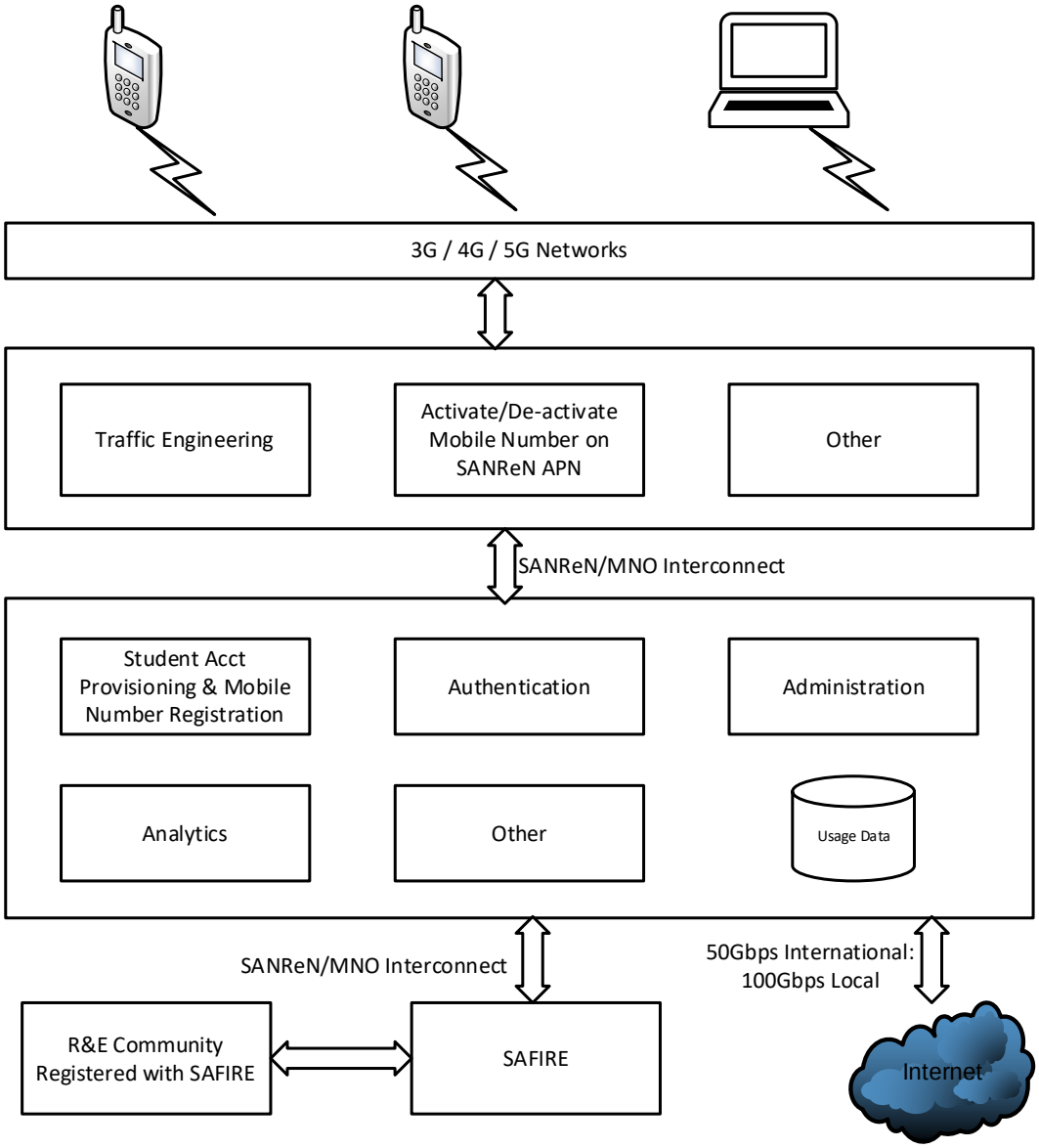
The SANReN team is proposing a **SANReN/Mobile Network Convergence** solution/product that is based on an APN. The solution is based on the routing of APN traffic network where it is then further routed to the rest of the SANReN network or the internet.

6.1 High-Level Functionality

- Creation/Configuration of a SANReN Access Point Name (sanren_apn) on the Mobile Network Operator (MNO) network.
- An APN based product that will enable the routing to Research and Education (R&E) traffic over the MNO's network to the SANReN network.
- A network interconnect between the MNO and the SANReN network.
- A mechanism/interface for the registration and deregistration of existing MSISDN on the sanren_apn
- Zero rating of the sanren_apn traffic
- A bandwidth-based (i.e., not data bundles) solution for the SANReN network traffic.
- A bandwidth-based pricing model between the MNO and the CSIR.

6.2 High-Level Solution

Below is a high-level design of the APN solution for the provisioning of network connectivity.



The connectivity process can be summarised as follows:

6.2.1 Registration

- A student/researcher goes to www.sanren.ac.za and selects to register for the internet connectivity
- The registration application directs the student to the SAFIRE portal (i.e. an organisation that provides identity federation to participating research and education (R&E) institutions)
- The student will log in to the SAFIRE portal thereby ensuring that they are an active student/researcher of the South African Research and Education community
- SAFIRE returns a response to the SANReN registration portal that the student is currently registered or a researcher, including other attributes like student/researcher, name of the home institution, etc.

- The SANReN registration portal creates a profile for the student/researcher and asks for their MSISDN (i.e., mobile phone number) and MNO
- The SANReN Registration portal sends the MNO a request to register the supplied MSISDN number on the sanren_apn
- On the success of the MSISDN registration on the sanren_apn, a username (i.e., the email address of the home institution)/password pair is created and shared with the user including the sanren_apn details

6.2.2 Usage

- The generated password expires every 30 days forcing the user to log in to the SANReN portal (via SAFIRE which ensures the user is still an active participant of the R&E community of South Africa) to get a new password.
- Whenever the student/researcher wishes to use the SANReN internet, they would switch to the sanren_apn using whatever process supported by their specific device
- Student/researcher traffic will be routed to the SANReN network where authentication is made to ensure the credentials are correct and network connectivity is provided if authentication is passed.

7 RFI SPECIFICATIONS

7.1 SANReN Proposed Solution

7.1.1 SANReN/Mobile Network Integration

The respondents are requested to provide a design of an APN solution including detailed information on how the CSIR will be able to assign a certain amount of traffic to a particular MSISDN.

7.1.2 Existing Infrastructure

The solution needs to be able to work with current mobile subscriber numbers that can be registered with the MNO. This will limit the amount of disruption to the CSIR beneficiaries and remove the need to manage the procurement of new SIM cards.

The CSIR has a presence in all the major data centres nationally with bandwidth capacity that is multiples of 100Gbps. The respondents are encouraged, where possible, to design a solution that will take full advantage of existing infrastructure.

7.1.3 Operations

The respondent is requested to share the details of how each SIM card will be registered/assigned to a user.

The respondents are also requested to share as many details as possible on the APN fields that are used by mobile subscribers on their devices, more importantly, the use of the username and password fields.

The CSIR intends to do the following in order to provide mobile network connectivity to the SA NREN community:

- Register an APN with a Mobile Network Operator or any other organisation offering such services
- Procure an interconnect to the MNO's network in the form of bandwidth, not data bundles
- Route APN traffic to the SANReN network
- SANReN will then forward the APN traffic to the SANReN network and also offer internet connectivity

7.1.4 Bandwidth Interconnect

The CSIR is strictly looking for a bandwidth-based solution. Costing for this service should be at a flat rate, calculated on the agreed interconnect bandwidth between the MNO and SANReN network, not based on data usage or a bundled cap. This means that the CSIR wants a solution that will interconnect with the Mobile Network Operator (MNO) in any one of the major data centres e.g. IS or Teraco, with an interconnect bandwidth of 10Gbps between the two networks.

7.1.5 Traffic management

The CSIR will manage the amount of data and traffic associated with each user, however, if the MNO has a system to manage data usage, the respondent is encouraged to share that information.

SANReN intends to put mechanisms in place to ensure the following:

- The users of the system do not abuse the system to the detriment of other users
- Limit the number of sites that are allowed
- Shape the traffic of a particular user based on their usage patterns and other attributes, etc.

Suggestions to achieve these goals are welcome.

7.1.6 Solution Design, Application and Hardware

The respondents must provide a detailed design of the solution, including any equipment and software that will need to be procured by the CSIR.

7.1.7 Budgetary Pricing

Respondents are requested to provide budgetary pricing for each of their proposed solutions. Each budgetary pricing must be for a one (1) year and a three (3) year solution. The pricing must also be based on 1Gbps, 5Gbps, 10Gbps and 20Gbps interconnect bandwidth with the MNO. The SANReN is not looking for individual user-based pricing but, preferably, a total available bandwidth type of a solution.

The respondents are encouraged to provide separate line items for pricing to allow for easy analysis of the involved costs of a solution. At the respondent's discretion, some items may be aggregated where it seems reasonable without the loss of analysis power that may be lost by too much aggregation.

The pricing must be inclusive of any other costs that the respondent deems relevant.

7.2 Other Possible Solutions

Respondents are strongly encouraged to provide other types of solutions that would make the provision of network connectivity to the R&E community possible. Below are some of the possible ideas, however, respondents are encouraged to propose other ideas.

Respondents to indicate if the proposed solution is a custom-made solution or a product already in place ready for customisation for the CSIR needs.

The one key requirement is that the CSIR is not interested in data bundle-based solutions, such solutions may be proposed but will not be reviewed enthusiastically for a long-term solution.

7.2.1 Virtual Private Network Based Solutions

Student/researcher traffic is tunnelled inside a VPN, over the Mobile Network Operator (MNO) network, from the user’s device to a VPN server on the SANReN network. The respondents are requested to provide a design of a VPN solution including detailed information on how the CSIR will be able to assign a certain amount of traffic to a particular username/email address. This can be in the form of an identifier that allows the CSIR to link the traffic to a particular user.

7.2.2 Spectrum Based Solutions

Respondents are also encouraged to propose spectrum-based solutions; however, it should be noted that the CSIR currently does not have any spectrum in the mobile network space but is open to engaging the relevant statutory parties where a proposed solution shows promise.

8 VENUE FOR PROPOSAL SUBMISSION

All submissions must be submitted to: tender@csir.co.za

The CSIR requires that all RFI submissions be submitted electronically to tender@csir.co.za. Should the submission file size exceed 30 MB, respondents can submit in multiple emails. Use RFI 7036/10/03/2023 and the description of the RFI as the subject of your email.

9 RFI PROGRAMME

The RFI programme, as currently envisaged, incorporates the following key dates:

Table 2: RFI Programme

Issue of RFI documents:	Friday, 03 February 2023
Non-compulsory briefing session:	Date: Monday, 27 February 2023 Time: 10:00 am *to* 13:00 pm Link: https://teams.microsoft.com/l/meetup-join/19%3ameeting_ZDA2ZDljMjAtZmIzNC00ODdiLTgzN2MtZWY5MGE0MTJlYzY0%40thread.v2/0?context=%7b%22Tid%22%3a%222fd3c5d5-ddb2-4ed3-9803-f89675928df4%22%2c%22Oid%22%3a%22316fab44-3b74-4f3f-a494-2d5a239cade8%22%7d
Closing / submission Date:	Friday, 10 March 2023 at 16h30
Estimated contract duration	Not applicable

10 SUBMISSION OF RFI RESPONSE

Respondents are to submit at least the following (3) documents as part of their response:

1. Technical solution
2. Supporting documentation
3. Budgetary pricing and/or pricing model

Additional supporting documentation may be submitted as needed.

RFI submissions must be submitted at: tender@csir.co.za

All RFI submissions are to be clearly marked with the RFI number in the subject line of the email submission.

11 DEADLINE FOR SUBMISSION

RFI submissions shall be submitted to tender@csir.co.za no later than the closing date of **Friday, 10 March 2023** during the CSIR's business hours. The CSIR business hours are between 08h00 and 16h30.

Where a submission is not received by the CSIR by the due date and time via the stipulated email address, it will be regarded as a late submission. Late submissions may not be considered.

12 EVALUATION PROCESS

12.1 Evaluation of RFI submissions

All submissions will be reviewed by an evaluation team for adherence to technical requirements and price. Respondents are also encouraged to provide their B-BBEE status.

12.2 Preference points system

There is no preferential point system for this RFI as this is not a tender, however, respondents are requested to provide or indicate their B-BBEE status.

13 BUDGETARY PRICING PROPOSAL

Respondents are requested to provide budgetary pricing for each of their proposed solutions. Each budgetary pricing must be for a one (1) year and a three (3) year solution.

14 ENQUIRIES AND CONTACT WITH THE CSIR

Any enquiry regarding this RFI shall be submitted in writing to CSIR at tender@csir.co.za with "R*FI No. 7036/10/03/2023 - SANReN Student/Researcher Wireless Network Connectivity*" as the subject.

Any other contact with CSIR personnel involved in this RFI is not permitted during the RFI process other than as required through existing service arrangements or as requested by the CSIR as part of the RFI process.

15 MEDIUM OF COMMUNICATION

All documentation submitted in response to this RFI must be in English.

16 COST OF SUBMISSION

Respondents are expected to fully acquaint themselves with the conditions, requirements and specifications of this RFI before submitting proposals. Each respondent assumes all risks for resource commitment and expenses, direct or indirect, of their submission preparation and participation throughout the RFI process. **The CSIR is not responsible directly or indirectly for any costs incurred by the respondents of this RFI.**

17 CORRECTNESS OF RESPONSES

17.1 The respondent must confirm satisfaction regarding the correctness and validity of their submission and that all prices and rates quoted cover all the work/items specified in the RFI.

17.2 The respondent accepts that any mistakes regarding the solution and budgetary pricing and calculations will be at their own risk.

18 VERIFICATION OF DOCUMENTS

18.1 Respondents should check the numbers of the pages to satisfy themselves that none are missing or duplicated. No liability will be accepted by the CSIR in regard to anything arising from the fact that pages are missing or duplicated.

19 ADDITIONAL TERMS AND CONDITIONS

19.1 A respondent shall not assume that information and/or documents supplied to CSIR, at any time prior to this request, are still available to CSIR, and shall consequently not make any reference to such information document in its response to this request.

19.2 Copies of any affiliations, memberships and/or accreditations that support your submission can be included at the respondent's discretion.

20 CSIR RESERVES THE RIGHT TO

20.1 Extend the closing date;

20.2 Verify any information contained in a submission;

21 DISCLAIMER

This RFI is a request for proposals only and not an offer document. Submissions to this RFI must not be construed as an acceptance of an offer or imply the existence of a contract between the parties. By submission of its proposal, respondents shall be deemed to have satisfied themselves with and to have accepted all Terms & Conditions of this RFI. The CSIR makes no representation, warranty, assurance, guarantee or endorsements to respondents concerning the RFI, whether with regard to its accuracy, completeness or otherwise and the CSIR shall have no liability towards the respondent or any other party in connection therewith.