Eskom National Transmission Company South Africa ™	Scope of Work	Telecommunications

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Compiled by	**Functional Responsibility**	**Authorized by**
M. Shibani	**TP Mahlangu**	**M Hina**
Design Planner	**ND Manager**	**NPAE Manager**
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Content

Page

Figures

N/A

Tables

N/A**No table of figures entries found.**

1. Introduction

In today's rapid evolving technology landscape, the need for an IP Address Management (IPAM) solution in a telecommunications environment cannot be overstated.
Without an IPAM solution, IP Telecoms team encounter several hurdles that impede network efficiency and scalability. The challenges include the inability to effectively allocate and track IP addresses, difficulties in maintaining accurate network documentation, increased risk of IP address conflicts and overlapping. Manual management processes become time-consuming and error prone as the network expands, exacerbating the strain on IP Telecoms team.

This document specifies the requirements for a turnkey solution to upgrade the IPAM solution.

2. Supporting Clauses

2.1 Scope

This document details the minimum requirements that an IP address management for deployment at Telecommunications NMC shall adhere to and the scope for the provisioning of the IPAM solution.

2.1.1 Purpose

The purpose of this document is to define the minimum requirements for turnkey solution for the IPAM system. This document is intended to be used to select a suitable supplier that can develop the required solution, in full.

2.1.2 Applicability

This document shall apply throughout NTCSA.

2.1.3 Effective date

This document is effective from the date of the last authorizing signature.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

[1] ISO 9001 Quality Management Systems.

[2] 240-170000369 IP Address Management Solution Functional Specification

[3] 240-86458714 Generic Network Management Specification Standard

[4] 240-130816381 Scope of Work for Support of Telecommunications Network and Related Systems

[5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

[6] 240-170001061 Transmission Cyber Security Standard for Operation Technology

[7] 32-85 Eskom Information Security Policy

[8] 240-170000587 Technical Evaluation Criteria for ET IP Address Management Solution

2.2.2 Informative

[9] 32-9 Definition of Eskom Documents

[10] 32-644 Eskom Documentation Management Standard

2.3 Definitions

Definition	Description
IPAM	IP Address Management is an integrated suite of tools that enables end-to-end planning, deploying, managing and monitoring of IP address infrastructure, with a rich user experience. IPAM enables IP database to be managed from a central interface.

2.4 Abbreviations

Abbreviation	Explanation
DCN	Data Communications Network
DHCP	Dynamic Host Configuration Protocol
HLD	High Level Design
IP	IP Address Management
IPAM	IP Address Management
LLD	Low Level Design
NMC	Network Management Centre
NPAE	National Planning and Application Engineering
NTCSA	National Transmission Company of South Africa
OEM	Original Equipment Manufacturer
RACI	Responsible, Accountable, Consulted, Informed
Telecoms	Telecommunications
TT	Transmission Telecommunications
SHEQ	Safety Health Environmental Quality

2.5 Roles and Responsibilities

2.5.1 NTCSA's responsibilities

a) Create a conducive environment for the supplier by making relevant resources (people and workspace) available.

b) Provide network access in accordance with the relevant Eskom security policies/procedures.

c) Provide support functions and services required for the solution.

d) Provide technical support and specialist knowledge of the NMC environment (power, cooling, cabling, cabinet space, wiring, Local Area Network (LAN), systems, applications) and the NTCSA Telecommunications' Wide Area Network (WAN).

2.5.2 Supplier's responsibilities

a) Respond to the enquiry with a technical proposal, accompanied by a high level design and project schedule to address the requirements specified in **Error! Reference source not found.** 240-170000369 IP Address Management Solution Functional Specification and [2] 240-86458714 Generic Network Management Specification Standard

b) Design (HLD & LLD), development, implementation, testing, installation, commissioning, and support of the solution.

c) Produce the Implementation Plan documentation for implementing the solution.

d) Produce Installation Test Procedures and Acceptance Test Procedures for the solution.

e) Training and skills transfer on the operation, administration and maintenance of the solution.

f) Handover of solution documents (design, planning, maintenance, administration and operation).

2.6 Process for Monitoring

The implementation of this document will be through a procurement/commercial process. The management of the document will be done according to NTCSA's document and records management standards.

2.7 Related/Supporting Documents

This document is supported by the following documents:

a) 240-86458714 Generic Requirements Specification for a Telecommunications Network Management Solution.

b) 240-135089195 Generic Technical Requirements for Eskom Telecoms Contracts.

3. IP Address Management Solution

3.1 Design requirements

The solution shall support planning, collection, and allocation of IP addresses.

3.1.1 Design assurance

a) All designs produced shall be submitted for review by the relevant NTCSA design review committees, the supplier shall be able to present these, if required, and to take on full design accountability.

b) OEM validation of designs shall be obtained where applicable.

c) The supplier shall be OEM accredited to offer the solution (letter from OEM shall be provided as proof of accreditation).

d) The supplier shall be OEM accredited to offer the design and planning services on the offered solution (letter from OEM shall be provided as proof of accreditation).

e) Supplier shall provide case studies demonstrating use of offered solution. The case studies should be clear on the level of skills and expertise the supplier has with delivery of similar solutions (i.e., design, planning, installation, commissioning, SHEQ, and project management).

3.1.2 Solution description requirements

a) Supplier shall provide a design for the NTCSA's IPAM solution. The scope of the solution is for Highly Available (HA) IPAM solution.

b) The data centre sites where the IPAM solution are to be hosted are: Simmerpan NMC in Germiston (Gauteng) and Beacon Bay Cross NMC in East London (Eastern Cape).

c) The source of data will be various network devices installed in the field throughout the country and the servers within the data centres mentioned above.

3.1.3 Design constraints and parameters

a) This design shall at minimum address the following functional and technical requirements:

1) System specification

i. 240-170000369 IP Address Management Solution Functional Specification.

2) Network management specification

i. 240-86458714 Generic Network Management Specification Standard

3) Support requirements

i. 240-130816381 Scope of Work for Support of Telecommunications Network and Related Systems

ii. 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

b) Supplier shall clearly document and motivate for any deviations to any of the standards specified above.

c) The core/main of the system shall be designed to support or be extended to support a backup site, if required.

3.1.4 Design documentation/artefacts requirements

3.1.4.1 High level design (HLD)

a) The solution shall be accompanied by an HLD. An HLD comprises of document(s) detailing the overall architecture, solutions/systems configuration/layout and equipment and/or software selected. This should include information on design options, costing, constructability, procure-ability, operability, sustainability, reliability, availability, inspect-ability, test-ability, expandability, decommission-ability and all other risks considered prior to arriving at the recommended option. At least two options should be documented at this level.

b) The estimated costs associated with the design, including travel and subsistence to all the sites applicable shall be quoted for as a single line item per Data Centre in the Bill of Material (BoM) for the HLD.

c) The HLD shall be a returnable, as part of the technical proposal. It shall be accompanied by a detailed Bill of Materials (BoM) with associated quantities, costing/pricing and assumptions made (if any).

3.1.4.2 Low level design (LLD)

a) An LLD comprises of document(s) detailing the selected equipment, interfaces, modules, ports, software, firmware, operating systems, and applications for the solution. IP addressing plan, licensing and configuration templates. This should include information on Bill of Materials (BoM) and/or Quantities (BoQ).

b) The supplier shall provide the template(s) for the LLD for evaluation purposes.

c) The supplier shall develop the LLD after contract award, as part of the solution development process.

3.1.4.3 Design Guide

a) The supplier to develop a design guide (detailed planning and ordering document). This is a non-billable document that is expected from the supplier.

3.1.4.4 Blue Book

b) The supplier to develop blue books (planning blueprint, of what is to be implemented). This is a non-billable document that is expected from the supplier at the end of the implementation and covers the changes made to the design during the implementation stage.

3.2 Project management requirements

3.2.1 Project schedule

a) Supplier shall develop a Project Management plan. This detail shall at minimum address the following:

1) Project Schedule

2) RACI

3) Task Sequencing

4) Duration Estimation

5) Work Breakdown Structure

6) Risk Management Plan

b) The Project Management Plan is a returnable and shall accompany the HLD.

3.3 Implementation requirements

3.3.1 Supply and delivery requirements

This is as described in [5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

3.3.1.1 Installation and commissioning requirements

a) Implementation Plan comprises of document(s) detailing the installation and commissioning activities, site survey forms, staging plans, installation test plans (ITPs) and knowledge transfer plans (operator, administrator and technician), training plans (planner, operator, administrator and technician), and cutover plans.

1) The supplier shall provide the template(s) for the implementation plan for evaluation purposes.

2) The supplier shall develop the implementation plan after developing the LLD, as part of the solution development process.

b) Network Ready for Use (NRFU) comprises of document(s) detailing the acceptance test plans (ATPs), commissioning, and change management plans, operator readiness plans, maintenance, administration, disaster recovery plans and procedures.

1) The supplier shall provide the template(s) for the NRFU for evaluation purposes.

2) The supplier shall develop the NRFU after developing the implementation plan, as part of the solution development process.

c) The supplier to develop as-built documentation for each installation.

d) The remainder of the requirements are as described in [5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

3.4 Support and maintenance requirements

3.4.1 Network support requirements

This is as described in [4] 240-130816381 Scope of Work for Support of Telecommunications Network and Related Systems

3.4.2 Maintenance, repair and replacement service

This is as described in [4] 240-130816381 Scope of Work for Support of Telecommunications Network and Related Systems

3.4.3 Spares requirements

This is as described in [5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

3.4.4 Testing requirements

This is as described in [5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts

3.4.5 Ad hoc support requirements

a) Any other support (including design, design alterations, testing and development) required by NTCSA and not part of SLA shall be on time and material basis. The following sub-clauses shall be adhered to when applicable:

   1) New designs shall be submitted for approval to relevant NTCSA's technical governance committees, the supplier shall be able support this process as part of the design output.

   2) Alterations to existing designs shall be documented as engineering instructions (EIs) and be subjected to NTCSA's approval process, the supplier shall be able support this process as part of the design output.

   3) Design guidelines, in NTCSA's required format, shall be documented and be subjected to NTCSA's approval process, the supplier shall be able support this process as part of the design output.

   4) Configuration changes shall be subjected to NTCSA's change management process, the supplier shall be able to support this process as part of the ad hoc technical support

3.5 Training requirements

3.5.1 On the job training/mentoring/job shadowing

The requirements for informal training are as specified in [4] 240-130816381 Scope of Work for Support of Telecommunications Network and Related Systems

3.5.2 Formal training

The requirements for formal training are as specified in [5] 240-135089195 Generic Technical Requirements for NTCSA Telecoms Contracts**.**

3.6 Skills, expertise and experience requirements

3.6.1 Solution delivery experience

a) Supplier shall be able to demonstrate the functionality of the equipment at own premises or facilities, and should be able to accommodate a site visit by NTCSA as part of technical evaluation.

b) Supplier shall provide details on available resource capacity. This detail shall at minimum address the following:

1) Numbers of OEM certified professionals for each offered equipment. Highlight level and type of certification (e.g., associate / junior).

2) Numbers of in-house project managers and/or solution/service delivery managers and/or SHEQ resources that have handled similar projects and/or solutions involving equipment/solutions being offered.

3) National footprint and/or resource distribution

4) Available test facilities for functionality testing of equipment being offered

5) Delivery lead times (for each offered equipment, module, software and associated licences)

3.6.2 Solution support, maintenance and training experience

a) The supplier shall be OEM accredited to offer the support and maintenance services on the offered equipment/solution (letter from OEM shall be provided as proof of accreditation).

b) Supplier shall provide case studies supporting their service offering. The case studies should be clear on the level of skills and expertise the supplier has with telecommunications service delivery (i.e., service provisioning, operation, administration, maintenance, and training).

c) Supplier shall offer Support & Maintenance (S&M) for all technologies and/or solutions offered.

d) Support services to be broken down into varying service category options indicating varying SLA options.

e) Supplier shall provide details of S&M being proposed, with details such as e.g., “follow the sun” support model, access to global (world-wide) teams, service desk/portal (logging and management of incidents), SLA tracking, etc.

f) Supplier shall provide details on processes, systems and available resources for:

1) Fault Management – fault identification (root-cause analysis), isolation and resolution

2) Configuration Management – service provisioning, network configuration templates, change management

3) Accounting Management – user accounting, resource utilization, service accounting

4) Performance Management – equipment health reports, network health reports, node performance monitoring, end-to-end service reports

5) Security Management – user role & grouping, role-based security, user authentication, authorisation and accounting,

g) Supplier shall provide details on customer relationship management this includes:

1) Processes, procedures and service contracts (SLAs)

2) Available helpdesk, service desk, and/or call centre facilities for support ticket logging, routing and tracking.

3) Business continuity plans for offered service, and associated support systems (i.e., service desk and call centre operations).

h) Supplier shall provide details on available resource capacity. This detail shall at minimum address the following:

1) Spares holdings, testing, and distribution (spares management philosophy/policy), indicate location of warehouses to support NTCSA's operations.

2) Support lead times (for each offered equipment, module, software and associated licences)

3) Equipment and/or module repair turnaround times.

4) Training proposal (knowledge and skills transfer plan).

4. Acceptance

This document has been seen and accepted by:

Name	Designation
Cornelius Naidoo	Telecoms T&S Engineering Manager
Mfundiso Hina	Middle Manager NPAE
Thabang Mahlangu	Network Development Manager

5. Revisions

Date	Rev.	Compiler	Remarks
May 2025	1	M. Shibani	First Issue

6. Development Team

The following people were involved in the development of this document:

- Mthuthuzeli Shibani
- David Thakadu

7. Acknowledgements

None