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**ETHIOPIAN**  
COMMUNICATIONS AUTHORITY

## **Terms of Reference (ToR)**

**For**

**Consulting Firm to Provide Technical Assistance for the  
Establishment of an Internet Exchange Point in Ethiopia**

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## 1. Introduction

The Government of Ethiopia recognizes that efficient and resilient internet infrastructure is essential for national development, digital transformation, and the growth of the knowledge economy. However, Ethiopia currently relies heavily on international bandwidth and transit providers for domestic internet traffic exchange, resulting in high latency, increased operational costs, and limited control over national data flows.

To address these challenges, the Ethiopian government—through the Ministry of Innovation and Technology and the Ethiopian Communications Authority—has prioritized the establishment of an Internet Exchange Point (IXP). This initiative is part of the country’s broader digital development agenda, including efforts to expand connectivity, enhance local content hosting, promote cybersecurity, and stimulate the growth of data-driven services.

In support of this strategic objective, the government seeks to engage a qualified Consulting Firm to provide technical assistance in the planning, design, and implementation of the IXP. The consulting firm will offer expert guidance on technical architecture, governance, regulation, stakeholder coordination, and capacity building.

This Terms of Reference (ToR) outlines the scope, methodology, deliverables, and responsibilities for the firm to be contracted to support this important national initiative.

## 2. Background

In Ethiopia, internet access has grown significantly over the past decade, fueled by expanding mobile broadband coverage, increased digital literacy, and a growing ecosystem of digital services. However, much of Ethiopia’s local internet traffic continues to be routed through international links despite the emergence recently of peering arrangements among internet service providers (ISPs) and local data caches. This is partly due to the absence of a domestic **Internet Exchange Point (IXP)** for government-originated traffic. This results in high latency, inefficient bandwidth usage, increased operational costs for ISPs, and reduced quality of service for users.

Currently, Ethiopian ISPs exchange traffic via privately-run exchanges, often associated with local data centers, and with international transit providers. This undermines the country’s ability to keep local traffic within national borders. This setup not only inflates connectivity costs but also weakens the country's ability to promote local content development, ensure digital sovereignty, and respond to cyber threats efficiently.

Establishing an IXP in Ethiopia is expected to:

- Improve internet performance by reducing latency and round-trip times for domestic traffic
- Decrease international bandwidth costs for ISPs and content providers
- Promote the hosting and development of local content and services
- Strengthen national cybersecurity and digital sovereignty

- Enhance collaboration among network operators, government agencies, academia, and the private sector

Recognizing these benefits, the Government of Ethiopia—through the relevant regulatory and ICT authorities—intends to establish a neutral, sustainable, open access and secure IXP that will serve as a cornerstone for the country’s evolving digital infrastructure.

To ensure the technical and institutional soundness of this initiative, the government is seeking to engage an experienced consulting firm that can deliver end-to-end support through this strategic undertaking.

### 3. Objectives of the Assignment

The main objective of this assignment is to provide the Government of Ethiopia with comprehensive technical assistance in the establishment of an Internet Exchange Point (IXP) that is efficient, secure, inclusive, and sustainable. The selected consulting firm will support the government in developing and implementing a robust IXP framework that achieves the following specific objectives:

1. **Improve Local Internet Traffic Exchange:** Enable direct traffic exchange between local Internet Service Providers (ISPs), mobile network operators (MNOs), content delivery networks (CDNs), State-Owned Enterprises (including energy and railway utilities), and academic networks (notably EthERNET) to reduce latency and bandwidth costs.
2. **Enhance Network Efficiency and Resilience:** Design and implement a technically sound, scalable IXP architecture that supports reliable and secure routing of domestic internet traffic.
3. **Strengthen Regulatory and Institutional Capacity:** Provide expert guidance on policy, legal, and regulatory frameworks required to support open, fair, and competitive IXP operations in Ethiopia.
4. **Develop a Sustainable Governance Model:** Support the establishment of an inclusive and transparent governance structure for the IXP, involving relevant public and private sector stakeholders.
5. **Support Stakeholder Engagement and Capacity Building:** Facilitate consultations, workshops, and technical trainings to build awareness and capacity among ISPs, government entities, academia, and other ecosystem players.
6. **Develop an Implementation Roadmap:** Provide the government with a clear, actionable roadmap for IXP deployment, including infrastructure requirements, timelines, budget estimates, and risk mitigation measures.
7. **Strengthen Regional Linkages:** Allow Ethiopia’s neighbors to transit and exchange traffic in a secure and cost-effective manner.

Through this assignment, the consulting firm will contribute to the realization of Ethiopia's broader digital transformation goals by supporting the creation of a critical piece of national internet infrastructure.

#### 4. Scope of Work

The consulting firm shall provide comprehensive technical assistance to the Government of Ethiopia in the design, development, and implementation of an Internet Exchange Point (IXP). The scope of work shall include, but not be limited to, the following key areas:

##### 4.1. Feasibility Study and Needs Assessment

- Assess the current national internet ecosystem, including Internet Service Providers (ISPs), Mobile Network Operators (MNOs), Content Delivery Networks (CDNs), State-Owned Enterprises (SoEs), data centers, and peering practices.
- Review the development and role of privately-run exchanges and local data caches in Ethiopia.
- Analyze existing internet traffic flows to identify inefficiencies and bottlenecks resulting from the lack of effective local peering and domestic traffic exchange.
- Identify legal, regulatory, technical, and institutional barriers to the establishment and efficient operation of a national IXP.
- Conduct stakeholder mapping and readiness assessment to evaluate the willingness, capacity, and expected participation of key public and private sector actors.
- Assess and recommend optimal site(s) for hosting the IXP, considering technical, geographic, infrastructure, and security factors.
- Analyze international best practices in IXP design, governance, and sustainability, and recommend models best suited to the Ethiopian context.
- Evaluate the overall technical, regulatory, and market readiness for the deployment of a national IXP, highlighting gaps and recommending actionable measures to address them.

##### 4.2. Technical Design and Architecture

- Recommend the most suitable IXP model for Ethiopia (e.g., centralized, decentralized, regional), based on traffic patterns, stakeholder distribution, and infrastructure readiness.
- Consider and evaluate hosting options for the IXP, including fully private, public-private partnership, government-led, or academic institution-based models.

- Develop a comprehensive technical architecture, including network topology, routing policies, switching infrastructure, data caches, and redundancy mechanisms to ensure high availability and performance.
- Specify hardware and software requirements, including core switches, routers, route servers, servers for management and monitoring, and security appliances.
- Define physical site requirements for the IXP, including data center standards for power supply, cooling, fire protection, and physical security measures.
- Ensure the technical design supports both IPv4 and IPv6 traffic, secure route server configurations (e.g., RPKI, BGP filtering), and scalability to accommodate future growth in participants and traffic volumes.
- Incorporate international best practices in IXP design, drawing lessons from leading global examples such as DE-CIX, LINX, and KIXP, and adapt them to the Ethiopian technical and regulatory environment.
- Develop high-level network diagrams, technical specifications, and deployment guidelines to support procurement, installation, and commissioning phases.

#### **4.3. Regulatory, Legal, and Policy Advisory**

- Review the existing legal and regulatory frameworks governing internet infrastructure, interconnection, and data governance in Ethiopia.
- Identify gaps and barriers that could affect the establishment and sustainable operation of a neutral, open-access IXP.
- Provide expert recommendations for policy, legal, and regulatory reforms to enable fair, open, and competitive IXP operations.
- Draft model regulatory provisions or guidelines to support peering, access, and interoperability among IXP participants.
- Advise on licensing, authorization, and compliance requirements tailored to ensure inclusivity, neutrality, and transparency in IXP governance.
- Align recommendations with international best practices and norms, drawing insights from regional and international institutions such as Af-IX, ISOC, and ITU.
- Propose governance frameworks that ensure multi-stakeholder participation, neutrality, and equitable decision-making processes within the IXP.
- Review and incorporate existing plans and studies related to internet governance reforms, including the planned transfer of the management of the .et country-code top-level domain (ccTLD) from Ethio Telecom to the Ethiopian Communications Authority (ECA).
- Develop operational guidelines and model peering agreements that facilitate efficient interconnection, access, and secure traffic exchange.

- Recommend policy measures to encourage local content development, regional interconnection, and support national cybersecurity objectives, including resilience and data protection strategies.

#### **4.4. Governance and Sustainability Framework**

- Propose a governance structure for the IXP that ensures neutrality, transparency, and inclusivity, enabling fair participation from ISPs, MNOs, CDNs, State-Owned Enterprises (SoEs), academia, and other relevant stakeholders.
- Recommend a legal and institutional setup that clearly defines the roles and responsibilities of the governing body, members, and operational management team.
- Develop membership criteria, participation rules, and decision-making processes that foster an open and collaborative environment.
- Propose financial models and cost-recovery mechanisms that ensure the long-term financial sustainability of the IXP, including membership fees, port charges, and service-based revenues.
- Provide recommendations for a transparent fee structure that is fair, competitive, and encourages participation, particularly by smaller ISPs and new market entrants.
- Advise on administrative policies related to governance processes, including elections of board members, conflict resolution, transparency, and reporting obligations.
- Recommend strategies to ensure the operational and financial independence of the IXP, minimizing potential conflicts of interest and regulatory capture.
- Benchmark the proposed governance and sustainability framework against successful models from established IXPs globally and adapt them to Ethiopia's specific context.
- Provide guidelines for periodic governance review and updates to ensure the model evolves with the changing market, technology, and regulatory environment.

#### **4.5. Stakeholder Engagement and Capacity Building**

- Identify and map key stakeholders, including ISPs, MNOs, CDNs, State-Owned Enterprises (SoEs), academic institutions, government agencies, and private sector actors relevant to the IXP ecosystem.
- Develop a stakeholder engagement strategy to ensure broad participation, build consensus, and foster ownership among all interested parties.
- Facilitate stakeholder consultations, technical working groups, and focus group discussions to gather inputs and align expectations regarding the IXP's establishment and operation.
- Organize and deliver awareness workshops to educate stakeholders on the benefits of the IXP, peering best practices, and the importance of local traffic exchange.

- Design and implement capacity-building programs to develop the technical and operational skills required for IXP operations, including routing, switching, network security, and traffic management.
- Provide specialized training on regulatory and governance aspects for policy makers, regulatory bodies, and IXP management teams.
- Develop training materials, manuals, and toolkits tailored to the needs of different stakeholder groups to ensure knowledge transfer and long-term capacity building.
- Organize experience-sharing activities such as study tours, exchange programs, or virtual engagements with established IXPs and Internet organizations (e.g., DE-CIX, LINX, KIXP, Af-IX, ISOC) to expose key stakeholders to international best practices and operational models.
- Establish mechanisms for continuous stakeholder engagement and feedback throughout the IXP development and operational phases.
- Promote regional collaboration and knowledge exchange by facilitating partnerships with established IXPs and regional Internet organizations.

#### **4.6. Procurement and Implementation Support**

- Prepare detailed technical specifications and requirements for the procurement of IXP infrastructure, including core switches, routers, route servers, network management systems, security appliances, and auxiliary equipment (e.g., racks, power, and cooling systems).
- Develop comprehensive technical documentation, including functional specifications, equipment lists, network architecture diagrams, and environmental requirements, to be incorporated into the bidding documents.
- Define technical performance requirements, interoperability standards, scalability provisions, and security considerations that align with international best practices and the specific needs of Ethiopia's IXP project.
- Provide technical oversight during the implementation phase to ensure that the infrastructure deployment is consistent with the prepared technical specifications and design requirements.
- Support and advise during the testing and commissioning phases by reviewing test plans, witnessing critical tests, and verifying that the infrastructure meets the defined technical requirements.
- Assist in validating the functional performance of the installed infrastructure and advise on compliance with the design specifications.
- Ensure that the final delivered infrastructure supports IPv4 and IPv6 protocols, network resilience, cybersecurity best practices, and facilitates regional interconnection capabilities.

#### 4.7. Implementation Roadmap

- Develop a detailed and realistic implementation roadmap for the establishment of the IXP, outlining all key activities, deliverables, and milestones from inception to operational launch.
- Define a phased implementation approach, identifying dependencies, critical path activities, and sequencing of technical, regulatory, and stakeholder engagement tasks.
- Prepare an integrated project schedule, including timelines, resource requirements, and responsibilities, to ensure effective coordination between the government, implementer, and other stakeholders.
- Identify potential risks and challenges that could impact the project timeline or objectives and propose mitigation strategies to address them.
- Provide budgetary estimates for each phase of the implementation to assist in financial planning and resource allocation.
- Ensure that the roadmap accounts for infrastructure deployment, system integration, testing and commissioning, capacity building, and operational handover stages.
- Recommend monitoring and evaluation (M&E) mechanisms to track progress against the roadmap and facilitate timely decision-making.
- Align the implementation roadmap with Ethiopia's broader digital development strategies and regional interconnection goals to ensure long-term relevance and scalability.
- Provide guidelines for the transition from project implementation to steady-state operations, ensuring sustainability and ongoing performance monitoring.

### 5. Deliverables and Expected Outputs

The Consulting Firm shall deliver a comprehensive set of outputs to ensure the successful establishment of the Internet Exchange Point (IXP) in Ethiopia. The expected deliverables include:

#### 1. Inception Report

- A detailed inception report outlining the Consulting Firm's understanding of the assignment, refined objectives, proposed methodology, and work plan.
- A stakeholder engagement and communication strategy.
- Risk identification and proposed mitigation strategies.
- Submission within [e.g., one month] of contract signature for approval by the Client.

#### 2. Feasibility Study and Needs Assessment Report

- An in-depth analysis of Ethiopia’s existing internet ecosystem, peering practices, technical and regulatory environment, and key challenges.
  - Evaluation of international IXP best practices with recommendations for an appropriate model tailored to Ethiopia’s needs.
  - Identification of optimal site(s) for the IXP and a gap analysis highlighting legal, institutional, and technical barriers.
- 3. Technical Design and Architecture Document**
- Detailed IXP network design including topology diagrams, equipment specifications (switches, routers, route servers, security appliances), and site infrastructure requirements (power, cooling, physical security).
  - Security frameworks to mitigate cyber risks and ensure resilience.
  - Recommendations for scalable, future-proof infrastructure supporting IPv4, IPv6, and regional interconnections.
- 4. Regulatory, Legal, and Policy Advisory Report**
- A comprehensive review of existing regulations and legal frameworks affecting interconnection, peering, and internet infrastructure.
  - Draft policy and regulatory recommendations to ensure open, fair, and neutral IXP operations.
  - Model regulatory provisions, peering guidelines, and a policy roadmap aligned with global standards (e.g., Af-IX, ISOC, ITU).
- 5. Governance and Sustainability Framework**
- Detailed governance models (e.g., multi-stakeholder, nonprofit structures) for neutral IXP operation.
  - Institutional arrangements and governance documents such as by-laws, membership guidelines, dispute resolution frameworks, and Terms of Participation.
  - Financial sustainability strategies including funding mechanisms and transparent fee structures.
- 6. Stakeholder Engagement and Capacity Building Plan**
- Stakeholder mapping and analysis report.
  - Strategy and plan for continuous engagement of ISPs, MNOs, academia, government, and private sector participants.
  - Framework for capacity building and experience-sharing activities to ensure local knowledge development.
- 7. Technical Specifications and Procurement Documentation**
- Preparation of detailed technical specifications, functional requirements, and performance standards for IXP infrastructure procurement.

- Comprehensive annexes, equipment lists, and technical documentation ready for inclusion in the bidding documents.

#### **8. Implementation Roadmap**

- A phased and realistic roadmap detailing all steps for IXP establishment, including timelines, key milestones, resource plans, and budget estimates.
- Risk management framework and monitoring & evaluation (M&E) mechanisms to ensure successful implementation.

#### **9. Testing and Commissioning Support**

- Technical advisory support during infrastructure testing and commissioning phases.
- Validation and compliance verification reports ensuring installations meet design and performance specifications.

#### **10. Training and Knowledge Transfer Oversight**

- Training framework outlining the technical and governance topics to be covered by the implementer.
- Review and quality assurance of training materials and sessions delivered by the implementer.
- Recommendations for knowledge retention strategies and succession planning.

#### **11. Final Report**

- A comprehensive report summarizing the consulting assignment, key findings, challenges encountered, solutions adopted, and recommendations for future scalability and operational improvements.
- All supporting documents, diagrams, and annexes compiled and submitted both electronically and in hard copy.

#### **12. Format and Submission:**

All deliverables shall be prepared in English, professionally formatted, and submitted in both editable electronic format and hard copy. The intellectual property rights of all deliverables shall belong to the Client.

## **6. Methodology and Work Plan**

### **6.1. Methodology**

The Consulting Firm shall adopt a structured and phased approach to ensure the successful delivery of the assignment. The methodology shall be based on international best practices, adapted to the Ethiopian context, and designed to ensure quality, transparency, and broad stakeholder engagement. The key elements of the proposed methodology include:

- **Diagnostic and Assessment:** Conduct desk reviews, field assessments, and stakeholder consultations to understand the existing internet ecosystem, peering environment, and regulatory frameworks. Benchmark Ethiopia’s situation against international experiences to identify gaps and actionable insights.
- **Stakeholder Engagement and Consensus Building:** Facilitate inclusive consultations, technical working groups, and workshops with ISPs, MNOs, government agencies, academia, and private sector players to ensure ownership and buy-in.
- **Evidence-Based Design and Recommendations:** Develop technical, policy, and governance recommendations grounded in validated data and best practices, ensuring the solutions are scalable, resilient, and aligned with Ethiopia’s needs.
- **Capacity Building and Knowledge Transfer Strategy:** Identify capacity gaps and design interventions to build technical and operational competencies. Recommend supplementary capacity-building activities such as study tours and knowledge exchanges.
- **Phased Approach:** Structure the assignment into clearly defined phases — Inception, Assessment, Design, Documentation, Stakeholder Engagement, Roadmap Development, and Final Reporting — with deliverables and milestones for each.
- **Quality Assurance and Validation:** Implement internal quality control processes and organize stakeholder validation workshops at key milestones to ensure accuracy, relevance, and stakeholder alignment.
- **Risk Management:** Identify potential risks early, propose mitigation strategies, and remain flexible to adapt to evolving project needs without compromising the objectives or quality.

## 6.2. Work Plan

As an integral part of the methodology, the Consulting Firm shall develop and submit a detailed **Work Plan** as part of the Inception Report. The Work Plan shall include:

- **Activity Breakdown:** Detailed description of key activities and sub-activities organized by project phases.
- **Timeline:** A comprehensive project timeline presented as a Gantt chart, showing activity sequencing, dependencies, and estimated durations.
- **Resource Allocation:** Assignment of key experts and team members to each activity or deliverable.

- **Deliverables Schedule:** Defined submission deadlines for interim and final deliverables, linked to project milestones.
- **Milestones and Decision Points:** Identification of critical milestones and decision points where client feedback or approval is required.
- **Monitoring and Review Mechanisms:** Proposed methods for progress tracking, delay management, and quality assurance.
- **Risk Management:** Outline of potential risks to the timeline and deliverables, with corresponding mitigation measures.

The Work Plan will be reviewed and approved by the Client during the inception phase and will serve as the primary tool for monitoring and managing the assignment. Periodic updates shall be made as necessary, subject to client approval.

## 7. Duration of the Assignment

The total duration of the assignment is expected to be **ten (10) months** from the date of contract signing.

The assignment shall be carried out in accordance with the agreed Work Plan, with key phases including:

- Inception and planning
- Situational assessment and feasibility study
- Technical design and regulatory advisory
- Stakeholder engagement and capacity-building planning
- Development of procurement documents and implementation roadmap
- Oversight during implementation, testing, commissioning, and knowledge transfer support
- Final reporting and closure

Interim deliverables and milestone reports shall be submitted according to the schedule defined in the approved Work Plan. The Consulting Firm is expected to allocate sufficient time and resources to ensure the timely completion of all phases and deliverables.

Adjustments to the schedule, if necessary, must be proposed by the Consulting Firm and approved by the Client in advance.

## 8. Location of the Assignment and Work Arrangements

The primary location for the assignment will be **Addis Ababa, Ethiopia**, where key stakeholders, including regulatory authorities, ISPs, MNOs, and other ecosystem players, are based.

The Consulting Firm is expected to:

- Undertake in-country missions to conduct situational assessments, stakeholder consultations, and validation workshops.
- Attend in-person meetings and workshops with the Client and relevant stakeholders as required during critical phases of the assignment.
- Maintain continuous engagement and communication with the Client through a combination of on-site presence and remote work, as appropriate.
- Ensure that senior experts are available for key engagements, including stakeholder workshops, technical validation sessions, and high-level consultations.
- Make use of virtual collaboration tools where feasible to complement physical engagements, ensuring efficiency and flexibility..

The Consulting Firm shall maintain a project management and coordination mechanism that ensures regular progress updates, efficient information sharing, and timely resolution of issues, whether activities are conducted on-site or remotely.

## 9. Client Support and Facilities Provided

To facilitate the successful execution of the assignment, the Client will provide the following support and facilities to the Consulting Firm:

- **Access to Information and Documents:**

The Client will facilitate access to relevant legal, regulatory, policy, technical, and market information necessary for the execution of the assignment, subject to confidentiality requirements.

- **Stakeholder Coordination Support:**

The Client will assist in coordinating meetings, interviews, and workshops with key stakeholders, including government agencies, ISPs, MNOs, content providers, and other relevant parties.

- **Meeting, Workshop, and Office Facilities:**

The Client will provide meeting venues for stakeholder consultations, technical workshops, and validation sessions as needed.

Temporary office space with basic amenities (internet access, desks, meeting rooms) will also be provided during the Consulting Firm's in-country missions.

- **Official Correspondence and Introductions:**

The Client will issue letters of introduction and official communications to facilitate the Consulting Firm's engagement with external stakeholders.

- **Project Focal Point:**

The Client will designate a Project Coordinator or Focal Point to serve as the primary liaison with the Consulting Firm, ensuring timely communication, feedback, and resolution of issues.

## 10. Reporting Requirements and Review Mechanism

The Consulting Firm shall adhere to a structured reporting schedule to ensure effective monitoring and evaluation of the assignment. The following reporting requirements apply:

- **Inception Report:** To be submitted within four (4) weeks of contract signing. It should outline the Consulting Firm's understanding of the assignment, methodology, detailed work plan, stakeholder engagement plan, risk assessment, and proposed deliverable schedule.
- **Interim Reports:** Progress reports shall be submitted at key milestones, as defined in the approved Work Plan. These reports shall summarize activities completed, highlight any challenges encountered, propose mitigation strategies, and update on the delivery schedule.
- **Draft Deliverables:** All major deliverables (Feasibility Study, Technical Design Document, Regulatory and Policy Advisory Report, Governance Framework, etc.) shall be submitted in draft form for the Client's review and comments before finalization.
- **Validation Workshops:** The Consulting Firm shall organize validation workshops at critical stages to present findings, gather stakeholder feedback, and refine draft deliverables accordingly.
- **Final Deliverables:** Following the incorporation of feedback from the Client and stakeholders, final versions of all reports and outputs shall be submitted for approval.
- **Final Consolidated Report:** A comprehensive final report summarizing the assignment, including key findings, recommendations, and lessons learned, shall be submitted at the end of the assignment.

### 10.1. **Submission Format and Language:**

All reports and deliverables shall be prepared in English, professionally formatted, and submitted in both editable electronic format (e.g., Word, Excel, PDF) and hard copy.

### 10.2. **Review Mechanism:**

- The Client will review all draft deliverables and provide consolidated feedback within [e.g., fifteen (15) working days] of submission.
- The Consulting Firm shall address all comments and resubmit the revised documents for final approval.
- All approvals will be communicated formally in writing by the Client.

### 10.3. **Monitoring Meetings:**

Periodic review meetings shall be held between the Client and the Consulting Firm to monitor progress, address any bottlenecks, and ensure alignment with project objectives.

## **11. Stakeholder Engagement, Consultation, and Workshop Facilitation**

Effective stakeholder engagement is critical to the success of the IXP establishment process. The Consulting Firm shall ensure broad-based consultation and active participation of all relevant stakeholders throughout the assignment. The following requirements apply:

- **Stakeholder Mapping and Analysis:** Identify and map key stakeholders, including Internet Service Providers (ISPs), Mobile Network Operators (MNOs), Content Delivery Networks (CDNs), State-Owned Enterprises (SoEs), academic institutions, government agencies, and other relevant entities.
- **Engagement Strategy:** Develop and implement a stakeholder engagement plan outlining the approach, frequency, and modalities for consultation to ensure inclusivity and transparency.
- **Consultative Meetings and Interviews:** Conduct bilateral and multilateral consultations with stakeholders to gather inputs, validate findings, and build consensus on key technical, regulatory, and governance aspects of the IXP.
- **Workshops and Focus Groups:** Organize thematic workshops and technical focus groups at critical stages of the assignment to facilitate in-depth discussions and capture a wide range of perspectives.

- **Validation Workshops:** Facilitate stakeholder validation workshops to review and discuss key draft deliverables such as the Feasibility Study, Technical Design, Regulatory Framework, and Governance Model before finalization.
- **Workshop Documentation:** Prepare and submit detailed reports on each workshop and consultation, summarizing discussions, capturing key feedback, and highlighting agreed-upon action points.
- **Communication Materials:** Develop presentations, briefing notes, and other communication materials to facilitate effective dialogue and ensure that stakeholders are well-informed throughout the process.
- **Inclusivity and Accessibility:** Ensure that the engagement process is inclusive, giving voice to small ISPs, marginalized groups, academia, and new market entrants, and that consultations are conducted in a manner accessible to all relevant parties.

The Consulting Firm shall work closely with the Client to coordinate stakeholder engagement activities, ensuring alignment with the Client’s broader communications and engagement strategies.

## 12. Confidentiality and Data Ownership

- **Confidentiality Obligations:** The Consulting Firm shall treat all information and data provided by the Client or obtained during the course of the assignment as strictly confidential. Such information shall not be disclosed to any third party without the prior written consent of the Client, except where required by law.
- **Use of Information:** The Consulting Firm shall use the information solely for the purpose of executing the assignment and shall not use it for any other purpose without the express written authorization of the Client.
- **Intellectual Property Rights:** All reports, documents, data, designs, technical specifications, and other outputs produced under this assignment shall become the exclusive property of the Client. The Consulting Firm shall not retain copies or make use of any project-related materials for purposes unrelated to the assignment without the prior written consent of the Client.
- **Data Security and Protection:** The Consulting Firm shall take appropriate measures to ensure the security of all project-related data and information, whether in physical or electronic form, and shall comply with applicable data protection and privacy laws and standards.

- **Return of Materials:** Upon completion or termination of the assignment, the Consulting Firm shall return all documents, equipment, and materials belonging to the Client and certify in writing that no copies have been retained, whether physical or digital.
- **Disclosure Restrictions:** The Consulting Firm shall ensure that its personnel, subcontractors, and associates involved in the assignment are bound by similar confidentiality and data protection obligations as specified in this ToR.

These obligations shall remain binding on the Consulting Firm and its personnel even after the conclusion or termination of the contract.

### **13. General and Specific Experience of the Firm**

The Consulting Firm must demonstrate both general experience in providing advisory services on internet infrastructure projects and specific experience relevant to Internet Exchange Point (IXP) design, implementation, and governance. The required experience includes:

#### **13.1. General Experience**

- A minimum of [e.g., 7] years of operational experience in providing technical consulting services in the ICT or telecommunications sector.
- Proven experience in delivering complex infrastructure advisory projects, including national-level ICT projects, broadband network development, or telecommunications regulatory advisory.
- Demonstrated capacity to work with government institutions, regulatory agencies, Internet Service Providers (ISPs), Mobile Network Operators (MNOs), and multi-stakeholder environments.
- Successful completion of at least three (3) consultancy assignments in developing countries or emerging markets.

#### **13.2. Specific Experience**

- Demonstrated expertise in the design, implementation, and operationalization of Internet Exchange Points (IXPs), including technical, governance, and regulatory aspects.
- Proven track record of advising on or leading IXP establishment projects in at least two (2) different countries or regions, preferably with at least one project in Africa or similar markets.

- Strong experience in network architecture design for IXPs, including routing, switching, peering arrangements, network security, and scalability considerations.
- Experience in drafting technical specifications and procurement documents for internet infrastructure projects.
- In-depth knowledge of international best practices, standards, and guidelines related to IXP operations, including familiarity with organizations such as Af-IX, Euro-IX, ISOC, and ITU.
- Demonstrated ability to facilitate stakeholder engagement processes, including consultations, workshops, and capacity-building initiatives.
- Previous experience in regulatory and policy advisory assignments related to telecommunications, internet infrastructure, or digital transformation strategies.

### 13.3. **Additional Requirements:**

- Strong project management capabilities with a track record of delivering assignments on time and within budget.
- Ability to mobilize a qualified and multidisciplinary team with expertise in technical, regulatory, and institutional areas relevant to IXP development.

Firms are encouraged to provide references and documentation (e.g., project completion certificates, client testimonials) to substantiate their claimed experience

## **14. Required Key Experts and Minimum Qualifications**

The Consulting Firm shall propose a qualified and experienced multidisciplinary team capable of delivering the services outlined in this Terms of Reference (ToR). The proposed team must include, at a minimum, the following key experts with the corresponding qualifications and experience:

### 14.1. **Team Leader / Project Manager**

- Advanced university degree (Master's or higher) in Telecommunications, Computer Science, Electrical Engineering, ICT, or a related field.
- Minimum of 10 years of experience managing ICT infrastructure or internet infrastructure advisory projects.
- Proven experience leading multi-stakeholder projects, preferably including IXP establishment or network infrastructure development.

- Strong project management skills, including planning, coordination, progress monitoring, and reporting.
- Demonstrated ability to organize and facilitate stakeholder consultations, workshops, and validation meetings, ensuring effective participation and consensus building among all relevant stakeholders.
- Excellent leadership, communication, and stakeholder engagement skills.
- Prior experience managing assignments in Africa or similar developing country contexts is an asset.

#### **14.2. Internet Infrastructure Expert**

- University degree (Bachelor's or higher) in Computer Science, Telecommunications, or a related technical field.
- Minimum of 7 years of hands-on experience in network design, routing, switching, and internet infrastructure.
- Specific expertise in the design and operationalization of IXPs, including knowledge of routing protocols (e.g., BGP), network security, redundancy, and scalability.
- Familiarity with IPv4 and IPv6 deployment, RPKI, route servers, and best practices in peering and interconnection.
- Experience working on similar assignments in developing or emerging markets is desirable.

#### **14.3. Network Security Specialist**

- University degree (Bachelor's or higher) in Cybersecurity, Information Security, Telecommunications, or a related field.
- Minimum of 7 years of experience in network security design and implementation.
- In-depth knowledge of security standards, threat mitigation strategies (e.g., DDoS protection), and best practices relevant to IXPs.
- Familiarity with global cybersecurity frameworks and standards (e.g., ISO 27001, MANRS).
- Experience providing security advisory services for critical internet infrastructure projects is an asset.

#### 14.4. **Legal and Policy Advisor**

- Advanced university degree in Law, Public Policy, Telecommunications Law, or a related discipline.
- Minimum of 7 years of experience in ICT sector regulation, telecommunications law, or internet governance policy development.
- Strong understanding of regulatory frameworks for internet infrastructure, peering, data governance, and competition policy.
- Prior experience advising on legal and regulatory aspects of IXP establishment or internet infrastructure projects.
- Familiarity with regional and international organizations (e.g., Af-IX, ISOC, ITU) and best practice guidelines for IXPs.

#### 14.5. **Training and Capacity Building Specialist**

- University degree in Education, Human Resource Development, ICT, or a related field.
- Minimum of 5 years of experience designing and delivering technical training and capacity-building programs, preferably in ICT or internet infrastructure.
- Experience in developing training curricula, materials, and facilitating workshops for technical and policy audiences.
- Familiarity with capacity-building practices for internet infrastructure projects, including stakeholder engagement strategies.

#### 14.6. **General Requirements for All Experts:**

- Fluency in English (written and spoken) is required.
- Strong interpersonal and communication skills.
- Ability to work collaboratively in a multidisciplinary and multicultural environment.
- Experience working in Ethiopia or the East African region will be considered an advantage.

### **15. Level of Effort (LoE) per Key Expert**

The Consulting Firm shall propose an adequate and realistic Level of Effort (LoE) for each key expert to ensure the successful delivery of the assignment. The indicative LoE for key

experts is outlined below based on a 10-month assignment period. (Assume 1 person-month = 20 person-days.)

| <b>Key Expert</b>                         | <b>Person-Months</b> | <b>Person-Days</b> |
|---|----------------------|--------------------|
| Team Leader / Project Manager             | 8 person-months      | 160 person-days    |
| Internet Infrastructure Expert            | 6 person-months      | 120 person-days    |
| Network Security Specialist               | 4 person-months      | 80 person-days     |
| Legal and Policy Advisor                  | 4 person-months      | 80 person-days     |
| Training and Capacity Building Specialist | 3 person-months      | 60 person-days     |

**Notes:**

- The **Team Leader / Project Manager** will be engaged across all phases, providing leadership, coordination, and ensuring stakeholder engagement and quality assurance.
- The **Internet Infrastructure Expert** will be heavily engaged during the technical design and infrastructure oversight stages.
- The **Network Security Specialist** and **Legal and Policy Advisor** will contribute targeted inputs during design, regulatory review, and technical oversight phases.
- The **Training and Capacity Building Specialist** will focus on the training framework development and oversight of knowledge transfer activities during the latter stages of the project.
- Person-days are calculated based on a standard of 20 working days per month.

The Consulting Firm may propose reasonable adjustments to the LoE based on their technical proposal but must provide justifications for any deviations.

**16. Curriculum Vitae (CV) Submission Requirements**

The Consulting Firm must submit detailed and signed Curriculum Vitae (CVs) for all proposed key experts. The CVs must demonstrate that the proposed experts meet or exceed the minimum qualifications and experience outlined in this Terms of Reference (ToR).

Each CV must include the following information:

1. **Personal Information**

- Full name
- Nationality
- Contact details (email address and telephone number)
- Languages spoken and proficiency levels

## **2. Educational Background**

- Degree(s) earned, institutions attended, and years of graduation
- Additional certifications relevant to the assignment (e.g., networking, cybersecurity, project management)

## **3. Professional Experience**

- Chronological list of relevant work experience, including:
  - Name of employer or organization
  - Title/position held
  - Dates of employment (start and end dates)
  - Detailed description of duties and responsibilities
  - Specific experience related to internet infrastructure, IXPs, network design, regulatory advisory, or capacity building (as applicable to the position)

## **4. Relevant Project Experience**

- Description of at least [e.g., three (3)] relevant assignments/projects related to the expert's field
- Clearly highlight roles played, contributions made, and relevance to IXP establishment, internet infrastructure projects, or telecommunications policy and regulation
- Indicate countries or regions where assignments were implemented, particularly in developing or emerging markets

## **5. Skills and Competencies**

- Technical and managerial skills relevant to the assignment
- Stakeholder engagement and facilitation skills (for applicable experts, especially the Team Leader)

## 6. Publications or Knowledge Contributions

- List any relevant publications, reports, or presentations (optional but encouraged for experts such as Legal and Policy Advisors)

## 7. References

- At least two professional references with full contact information

## 8. Certification

- A signed statement certifying that the information provided is accurate and that the expert is available for the duration and scope of the assignment if the Consulting Firm is awarded the contract.

## 9. Formatting Requirements:

- CVs must be no more than five (5) pages per expert.
- Font size: 11 points, standard professional font (e.g., Arial, Calibri).
- All CVs must be signed and dated by the expert.

## 17. Payment Terms

Payments to the Consulting Firm shall be made based on the successful completion and acceptance of specific deliverables, in accordance with the approved work plan and contract conditions. The payment schedule shall be milestone-based, linked to the submission and approval of key deliverables by the Client.

| # | Milestone                                       | Deliverable   | Payment (%) |
|---|---|---|-------------|
| 1 | Inception Phase                                 | Submission and approval of Inception Report   | 10%         |
| 2 | Situational Assessment and Feasibility Study    | Submission and approval of Feasibility Study Report   | 15%         |
| 3 | Technical Design and Regulatory Framework       | Submission and approval of Technical Design Document and Regulatory/Policy Advisory Report    | 20%         |
| 4 | Stakeholder Engagement and Governance Framework | Completion of stakeholder workshops and submission of Governance and Sustainability Framework | 15%         |

|   |  |   |     |
|---|--|---|-----|
| 5 | Procurement Documentation and Implementation Roadmap     | Submission and approval of technical specifications and implementation roadmap    | 15% |
| 6 | Oversight Support for Implementation and Training Review | Completion of oversight activities and review of training framework and materials | 15% |
| 7 | Final Consolidated Report                                | Submission and approval of Final Report   | 10% |

**17.1. Conditions:**

- Payments will be made upon receipt of invoice and after formal acceptance of each deliverable by the Client.
- The Client shall review and approve deliverables within 15 working days of submission.
- If revisions are required, the Consulting Firm shall address the comments and resubmit the deliverables promptly.

**18. Technical Evaluation Criteria**

Proposals submitted by Consulting Firms will be evaluated based on the quality of the technical proposal, the firm’s relevant experience, the qualifications of the proposed team, and the proposed knowledge transfer strategy. The evaluation will be structured around the following criteria:

| # | Evaluation Criteria                                | Sub-Criteria   | Maximum Points |
|---|--|--|----------------|
| 1 | <b>Adequacy of Methodology and Work Plan (30%)</b> | a) Clarity and relevance of the consultant’s understanding of the assignment objectives and scope          | 10 points      |
|   |  | b) Appropriateness, feasibility, and innovativeness of the proposed methodology for delivering the results | 10 points      |
|   |  | c) Coherence, realism, and completeness of the proposed work plan, timeline, and deliverables              | 10 points      |

|          |  |  |                  |
|----------|--|--|------------------|
|          |  | <b>Subtotal – Methodology and Work Plan</b>  | <b>30 points</b> |
| <b>2</b> | <b>Relevant Experience of the Firm (20%)</b>                         | a) Evidence of successful completion of three (3) similar assignments in telecom, IXP, or regulatory domains   | 10 points        |
|          |  | b) Experience working within similar regional, institutional, or regulatory contexts   | 5 points         |
|          |  | c) Quality of references and client satisfaction on previous projects  | 5 points         |
|          |  | <b>Subtotal – Firm Experience</b>  | <b>20 points</b> |
| <b>3</b> | <b>Qualifications and Relevant Experience of Key Personnel (40%)</b> | a) Team Leader / Project Manager: Demonstrated leadership in managing similar projects, technical expertise, and stakeholder coordination experience | 15 points        |
|          |  | b) Internet Infrastructure Expert: Proven hands-on experience with IXP design, configuration, BGP routing, peering, and network security             | 10 points        |
|          |  | c) Network Security Specialist: Experience in network security design, DDoS mitigation, and infrastructure resilience                                | 5 points         |
|          |  | d) Legal and Policy Advisor: Experience in telecom and internet policy development, regulatory frameworks, and institutional advisory                | 5 points         |
|          |  | e) Training and Capacity Building Specialist: Experience in stakeholder consultation, training program design, and capacity building                 | 5 points         |
|          |  | <b>Subtotal – Key Personnel</b>  | <b>40 points</b> |
| <b>4</b> | <b>Transfer of Knowledge and Capacity Building (10%)</b>             | a) Quality and clarity of the proposed knowledge transfer and institutional capacity-building approach   | 5 points         |

|  |              |  |                   |
|--|--------------|--|-------------------|
|  |              | b) Relevance and practicality of the proposed training tools, manuals, and post-project support strategies | 5 points          |
|  |              | <b>Subtotal – Knowledge Transfer &amp; Capacity Building</b>   | <b>10 points</b>  |
|  | <b>TOTAL</b> |  | <b>100 points</b> |