REQUEST FOR TENDERS

RFT: 2026-COSPPac-001
File: AP_3/24
Date: 22 October, 2026
To: Interested consultants
From: Siosinamele Lui, Traditional Knowledge Advisor

Subject: **Request for tenders (RFT): Upgrade of the Climate and Oceans Support Program in the Pacific (COSPPac) Traditional Knowledge Database (Version 5) – READVERTISEMENT**

1. Background

1.1. The Secretariat of the Pacific Regional Environment Programme (SPREP) is an intergovernmental organisation charged with promoting cooperation among Pacific islands countries and territories to protect and improve their environment and ensure sustainable development.

1.2. SPREP approaches the environmental challenges faced by the Pacific guided by four simple Values. These values guide all aspects of our work:

- We value the Environment
- We value our People
- We value high quality and targeted Service Delivery
- We value Integrity

1.3. For more information, see: www.sprep.org.

2. Specifications: statement of requirement

2.1. SPREP wishes to call for tenders from qualified and experienced consultants who can offer their services to upgrade the Climate and Oceans Support Program in the Pacific (COSPPac) Traditional Knowledge Database (TKDB) to its Fifth Version (V5).

2.2. The Terms of Reference of the consultancy are set out in Annex A.

2.3. The successful consultant must supply the services to the extent applicable, in compliance with SPREP's Values and Code of Conduct: https://library.sprep.org/sites/default/files/sprep-organisational-values-code-of-conduct.pdf. Including SPREP's policy on Child Protection, Environmental Social Safeguards, Fraud Prevention & Whistleblower Protection and Gender and Social Inclusion.

2.4. SPREP Standard Contract Terms and Conditions are non-negotiable

3. Conditions: information for applicants

3.1. To be considered for this tender, interested consultants must meet the following conditions:

i. Submit a detailed Curriculum vitae detailing qualification and previous relevant experience for each proposed personnel;
ii. Provide three referees relevant to this tender submission, including the most recent work completed;

iii. Complete the **tender application form** provided *(Please note you are required to complete in full all areas requested in the Form, particularly the Statements to demonstrate you meet the selection criteria – DO NOT refer us to your CV. Failure to do this will mean your application will **not** be considered).*
Provide examples of past related work outputs
For the Technical and Financial proposals you may attach these separately.

iv. Must meet local registration requirements where the consultant is based.

3.2 Tenderers must declare any areas that may constitute conflict of interest related to this tender and sign the **conflict of interest form** provided.

3.3 **Tenderer is deemed ineligible due to association with exclusion criteria, including** bankruptcy, insolvency or winding up procedures, breach of obligations relating to the payment of taxes or social security contributions, fraudulent or negligent practice, violation of intellectual property rights, under a judgment by the court, grave professional misconduct including misrepresentation, corruption, participation in a criminal organisation, money laundering or terrorist financing, child labour and other trafficking in human beings, deficiency in capability in complying main obligations, creating a shell company, and being a shell company.

3.4 Tenderer must sign a declaration of **honour form** together with their application, certifying that they do not fall **into** any of the exclusion situations cited in 3.3 above and where applicable, that they have taken adequate measures to remedy the situation.

4. Submission guidelines

4.1. Tender documentation should demonstrate that the interested consultant satisfies the conditions stated above and in the Terms of Reference and is capable of meeting the specifications and timeframes. Documentation must also include supporting examples to address the evaluation criteria.

4.2. Tender documentation should be submitted in English and outline the interested consultant's complete proposal:

a) **SPREP Tender Application form and conflict of interest form.** *(Please note you are required to complete in full all areas requested in the Form, particularly the Statements to demonstrate you meet the selection criteria – DO NOT refer us to your CV. Failure to do this will mean your application will **not** be considered).*
Provide examples of past related work outputs
For the Technical and Financial proposals you may attach these separately.

b) **Honour form**

c) **Curriculum Vitae** of the proposed personnel to demonstrate that they have the requisite skills and experience to carry out this contract successfully.

d) **Technical Proposal** which contains the details to achieve the tasks outlined in the Terms of Reference.

e) **Financial Proposal** – provide a detailed outline of the costs involved in successfully delivering this project submitted in United States Dollars (USD) and inclusive of all associated taxes.

f) Where relevant provide:
   i. Business registration/license (For Entities/ Individual consultant's as per relevant national legislations)
   ii. Tax Identification Number (TIN) Letter (If applicable for Individual consultant's as per relevant national legislations)

4.3. Provide three referees relevant to this tender submission, including the most recent work completed.

4.4. Tenderers/bidders shall bear all costs associated with preparing and submitting a proposal, including cost relating to contract award; SPREP will, in no case, be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

4.5. The tenderer/bidder might be requested to provide additional information relating to their submitted proposal, if the Tender Evaluation Committee requests further information for the purposes of tender evaluation. SPREP may shortlist one or more Tenderers and seek further information from them.

4.6. The submitted tender proposal must be for the entirety of the Terms of Reference and not divided into portions which a potential tenderer/bidder can provide services for.

4.7 The Proposal must remain valid for 90 days from date of submission.

4.8 Tenderers must insist on an acknowledgement of receipt of tender.

5. Tender Clarification

5.1. a. Any clarification questions from applicants must be submitted by email to procurement@sprep.org before 27 October 2026. A summary of all questions received complete with an associated response posted on the SPREP website www.sprep.org/tender by 29 October 2026.

b. The only point of contact for all matters relating to the RFT and the RFT process is the SPREP Procurement Officer.

c. SPREP will determine what, if any, response should be given to a Tenderer question. SPREP will circulate Tenderer questions and SPREP's response to those questions to all other Tenderers using the SPREP Tenders page (**https://www.sprep.org/tenders**) without disclosing the source of the questions or revealing any confidential information of a Tenderer.

d. Tenderers should identify in their question what, if any, information in the question the Tenderer considers is confidential.

e. If a Tenderer believes they have found a discrepancy, error, ambiguity, inconsistency or omission in this RFT or any other information given or made available by SPREP, the Tenderer should promptly notify the Procurement Officer setting out the error in sufficient detail so that SPREP may take the corrective action, if any, it considers appropriate.

6. Evaluation criteria

6.1. SPREP will select a preferred consultant on the basis of SPREP's evaluation of the extent to which the documentation demonstrates that the tenderer offers the best value for money, and that the tender satisfies the following criteria:

6.2. A proposal will be rejected if it fails to achieve 70% or more in the technical criteria and its accompanying financial proposal shall not be evaluated.

I. Technical Score – 80%

Criteria	Detail	Weighting
Qualifications, Experience & Capabilities	The company or consortium of consultants are required to provide a full composition of their team (if applicable) outlining experience and roles in line with the scope of the terms of reference.	10%

	At least one consultant to have: Minimum qualification of a Master's degree in Computer Science / Software Engineering / Information Systems / Information Technology or related field OR a Bachelor's degree with at least 5 years' working experience in Computer Science, Software Engineering, Information Systems,Information Technology or other relevant technical fields.	
	Demonstrated expertise and strong software delivery capability	4%
	Demonstrated expertise and strong experience in developing maintainable web-based systems and data-drive applications	4%
	Demonstrated expertise and strong experience with deployment, migration and backup/restore design.	4%
	Demonstrated expertise and strong ability to work with non-technical stakeholders and translate workflow needs into practical system design	4%
	Demonstrated expertise and strong experience in the Pacific region or in culturally sensitive knowledge management environments is desirable	4%
Technical Proposal / Methodology	Detailed work plan clearly outlining milestones and delivery timelines	15%
	Project management and recommended approach on how to deliver the scope of work in the attached terms of reference (Technical Proposal and Methodology)	35%

II. Financial Score – 20%

The following formula shall be used to calculate the financial score for ONLY the proposals which score 70% or more in the technical criteria:

$$\text{Financial Score} = a \times \frac{b}{c}$$

Where:
a = maximum number of points allocated for the Financial Score
b = Lowest bid amount
c = Total bidding amount of the proposal

7. Variation or Termination of the Request for Tender

7.1 a. SPREP may amend, suspend or terminate the RFT process at any time.

b. In the event that SPREP amends the RFT or the conditions of tender, it will inform potential Tenderers using the SPREP Tenders page (**https://www.sprep.org/tenders**).

c. Tenderers are responsible to regularly check the SPREP website Tenders page for any updates and downloading the relevant RFT documentation and addendum for the RFT if it is interested in providing a Tender Response.

d. If SPREP determines that none of the Tenders submitted represents value for money, that it is otherwise in the public interest or SPREP's interest to do so, SPREP may terminate this RFT

process at any time. In such cases SPREP will cancel the tender, issue a cancellation notice and inform unsuccessful bidders accordingly.

8. Deadline

8.1. **The due date for submission of the tender is: 4 November 2026, midnight (Apia, Samoa local time).**

8.2. Late submissions will be returned unopened to the sender.

8.3 Please send all tenders clearly marked **'RFT 2026-COSPPac-001: Upgrade of the COSPPac Traditional Knowledge Database (Version 5) – READVERTISEMENT'**

Mail: SPREP
Attention: Procurement Officer
PO Box 240
Apia, SAMOA
Email: tenders@sprep.org (MOST PREFERRED OPTION)
Fax: 685 20231
Person: Submit by hand in the tenders' box at SPREP reception,
Vailima, Samoa.

Note: Submissions made to the incorrect portal will not be considered by SPREP. If SPREP is made aware of the error in submission prior to the deadline, the applicant will be advised to resubmit their application to the correct portal. However, if SPREP is not made aware of the error in submission until after the deadline, then the application is considered late and will be returned unopened to the sender.

SPREP reserves the right to reject any or all tenders and the lowest or any tender will not necessarily be accepted.

SPREP reserves the right to enter into negotiation with respect to one or more proposals prior to the award of a contract, split an award/awards and to consider localised award/awards between any proposers in any combination, as it may deem appropriate without prior written acceptance of the proposers.

A binding contract is in effect, once signed by both SPREP and the successful tenderer. Any contractual discussion/work carried out/goods supplied prior to a contract being signed does not constitute a binding contract.

For any complaints regarding the Secretariat's tenders please refer to the Complaints section on the SPREP website
http://www.sprep.org/accountability/complaints

Annex A: Terms of Reference
TKDB v5 | May 2026

Organisation	SPREP
Project	COSPPac
Contract Duration	4 months

1. Title
Traditional Knowledge Database Upgrade (TKDB v5)

2. Contracting Entity
Secretariat of the Pacific Regional Environment Programme (SPREP)

3. Post Level
Company or Contractor (Developer)

4. Contract Duration
4 months

5. Background and Rationale
The Traditional Knowledge Database (TKDB) is a core component of the Climate and Oceans Support Program in the Pacific (COSPPac). It supports National Meteorological Services (NMS) to document, store and apply traditional knowledge related to weather and climate forecasting.

TKDB supports a broader workflow that spans community engagement and data collection through to data entry, secure storage, monitoring and use in reporting, seasonal forecasting and communication back to communities. This knowledge may include narratives, observations and indicators based on plants, animals, astronomical signs and other environmental signals. Some information is culturally sensitive and requires appropriate attribution, access controls and country ownership.

Historically, TKDB has been deployed using a virtual machine-based architecture supported by Vagrant, Ansible and Git repositories. While effective at the time, this approach requires specialised technical skills and has created challenges for deployment, recovery and long-term maintenance across multiple Pacific countries.

These complexities increase reliance on specialist staff and pose sustainability risks, particularly where there is staff turnover or limited local technical capacity. As a result, SPREP now seeks to modernise TKDB into Version 5 (TKDB v5) as a more maintainable, cloud-portable and user-friendly platform.

The upgraded system should retain the strengths of the current approach, including secure country ownership and support for culturally sensitive information, while improving usability, deployment, supportability, backup and restoration, and enabling seamless migration of existing TKDB v4 content.

6. Objectives

- Develop a modern TKDB v5 platform that is easier to deploy, use and maintain.
- Enable seamless migration of data, media and relevant structures from TKDB v4.
- Support country-owned deployments that preserve data sovereignty and appropriate access control.
- Improve usability for country-level users, including data entry, administration and reporting.
- Provide robust backup, restore and recovery capabilities.
- Support responsive access across desktop and mobile devices.
- Provide clear technical and user documentation.
- Ensure interview and data entry forms can be used in low-connectivity environments, including offline capture and later synchronisation.

7. Scope of Work

The Developer will undertake the following:

7.1 System Review and Analysis

- Review TKDB v4 architecture, workflows and operational materials, including deployment, administration, backup and restore processes.
- Review how TKDB is currently used across the TK lifecycle, from data collection and entry through to monitoring, reporting and communication.
- Identify usability, sustainability and supportability issues in the current implementation.

7.2 Solution Design

- Design a modern TKDB v5 solution that reflects the real TK workflow while remaining clear and usable for non-technical users.
- Propose a target architecture that is cloud-portable but not cloud-dependent, and suitable for deployment per country.
- Maintain support for culturally sensitive data and country-specific access controls.

7.3 Application Development

- Develop a modern web-based TKDB platform with intuitive interfaces for data entry, search, administration and reporting.
- Support the main data types and processes required by the TK project, including survey information, monitoring information, other records and media.
- Provide intuitive interfaces.

7.4 Deployment Model

- Design a repeatable deployment approach that can be used for individual country instances.

- Reduce reliance on complex virtual machine setup and manual provisioning.
- Provide a practical approach for installation, configuration and country customisation.

7.5 Data Migration

- Migrate existing TKDB v4 data, including database content and associated media files, into TKDB v5.
- Validate integrity and completeness of all data

7.6 Backup and Restore

- Implement automated backup arrangements for database content and uploaded media.
- Provide simple and well-documented restore procedures.
- Support recovery testing as part of implementation.

7.7 Training and Documentation

- Develop technical and user documentation.
- Provide training and handover to SPREP.

8. Deliverables

Deliverable	Description	Indicative Timing
1	Inception report and workplan, including review findings and implementation approach	Week 2
2	Solution architecture and design, including functional design and deployment approach	Week 4
3	Prototype / initial build of TKDB v5	Week 8
4	Data migration framework, mapping and testing • CI/CD test reports, Security checklist validation report • Accessibility compliance report (WCAG 2.2)	Week 10
5	Soft Launch / Pilot Deployment Validate performance, workflows, migration accuracy and usability	Week 12
6	TKDB v5 system ready for production • Production-ready codebase deployed and pushed to SPREP GitLab • CI/CD pipeline configured and operational	Week 14

	• All test cases passing (as defined in non-functional requirements)	
7	Technical documentation, user manual(s), training and final handover	Week 16

9. Functional Requirements

TKDB v5 should support the full traditional knowledge workflow in a clear, readable and practical way. At a minimum, the system should provide the following functional capabilities:

9.1 Core record management

- Store and manage traditional knowledge narratives, indicators, monitoring records, other records and associated media.
- Support structured entry of survey, protocol and monitoring information.
- Generate unique record identifiers and maintain linkages between related records.

9.2 Data collection and entry workflows

- Support workflows aligned with the TK project approach, including interview details, knowledge records, monitoring observations and other supporting records.
- Allow entry of text, images, documents and other relevant media.
- Reduce duplicate entry through reusable locations, objects, indicators and related reference data.

9.2A Offline Data Entry Capability

- Forms must be usable in low-connectivity or offline environments.
- Store form data locally when offline.
- Synchronise when connectivity is restored.
- Validate required fields.
- Save and resume incomplete records.
- Support media capture where feasible.

9.3 Indicator and monitoring management

- Support management of traditional indicators, including objects and actions such as plant, animal, astronomical and atmospheric indicators.
- Allow monitoring forms or monitoring structures to vary by country, while retaining a consistent system approach.
- Support ongoing monitoring records linked to indicators, locations and observation dates.

9.4 Search, reporting and export

- Provide search and filter capability across the main record types.

- Provide summary reporting and export options, including CSV or equivalent extracts where appropriate.
- Support practical reporting needs such as recent records, location-based reporting, monitoring activity and object frequency.

9.5 Access control, attribution and sensitivity

- Support role-based access control for administrators, editors and viewers.
- Allow culturally sensitive or restricted knowledge to be managed through defined permissions and group-based access rules.
- Preserve attribution of knowledge to the relevant person, group or community as appropriate.

9.6 Country configuration

- Allow country-specific deployment, branding and configuration.
- Support country-specific indicator sets, monitoring structures and local workflows.
- Allow each country instance to operate independently while following a common system design.

9.7 Communication and future integration support

- Enable information to be used for communication products, analysis and future forecast-related workflows.
- Be designed so future APIs or integrations can be added without major redesign.

10. Technical and Non-Functional Requirements

The TKDB v5 system must adopt a modern, maintainable and cloud-portable architecture that supports deployment across multiple Pacific Island countries, while remaining practical for agencies with limited technical capacity.

10.1 Architecture principles

- Cloud-first but not cloud-dependent.
- Modular and API-ready design.
- Low operational overhead and reduced dependence on specialist DevOps skills.
- Easy deployment and replication per country.
- Secure and scalable by design.

10.2 Technology approach

- The architecture options presented in proposals should be treated as recommendations rather than strict requirements. Bidders may propose alternative approaches where clearly justified and aligned with the objectives of TKDB v5.
- Open source technologies are strongly preferred where practical.

- Containerised deployment and PostgreSQL-compatible data storage are desirable, provided the overall solution remains supportable and sustainable.

10.3 Usability and accessibility

- Simple and intuitive interface for non-technical users.
- Responsive design that works well across desktop and mobile devices.
- Clear navigation and forms that minimise training effort.

10.4 Performance and operating context

- Optimised for low-bandwidth environments.
- Reasonable performance for search, form entry, reporting and media handling.
- Suitable for office environments where connectivity and technical support may vary.

10.5 Reliability, backup and recovery

- High service availability appropriate to the hosting model.
- Automated backup of database content and media.
- Documented restore and recovery procedures, with recovery testing.

10.6 Security and protection of knowledge

- Role-based access control and secure authentication.
- Encryption in transit and, where applicable, at rest.
- Protection of culturally sensitive data through permission controls and appropriate system design.

10.7 Maintainability and portability

- Easy to update, maintain and troubleshoot.
- Deployable in cloud-hosted or equivalent country-approved environments.
- Clear technical documentation to support long-term ownership by SPREP and participating countries.

10.8 Offline Capability

- Core data entry forms must function in low or intermittent connectivity environments.
- Offline-first or offline-capable architecture is strongly preferred (e.g. PWA or equivalent).
- Must be usable on standard devices without requiring a separate application.
- Must synchronise reliably without data loss or duplication

10.9 Code Quality, DevOps and CI/CD

- All production source code must be maintained in SPREP GitLab repositories.
- All development activities must follow version control best practices, including:
    - Feature branching

    - Pull/Merge Requests
    - Code reviews
- All issues, bugs and feature requests must be logged and tracked in SPREP GitLab.
- A CI/CD pipeline must be implemented and enforced for all code changes.

Minimum CI/CD checks must include:

- Coding standards validation (e.g. linting, formatting)
- Compatibility checks (e.g. PHP 8.4 or relevant runtime)
- No use of deprecated functions
- Automated smoke tests
- Security checks (authentication, access control, no guest access, etc.)
- Automated test execution (e.g. PHPUnit, Drupal Test Traits, PyTest, etc.)
- Web accessibility compliance checks (WCAG 2.2 where applicable)

10.10 Environment Strategy

- Separate environments required:
    - Development
    - Staging
    - Production
- Migration must first be validated in Staging
- Backup restore must be tested and demonstrated
- Provide recovery time estimate

10.11 Audit Logging

- Track
    - Who created / edited records
    - Access to restricted data
    - Changes to permissions

11. Data Migration

- Full migration of TKDB v4 data, including core records and associated media.
- Mapping of legacy structures to TKDB v5 structures with documented assumptions.
- Validation, reconciliation and issue logging for migrated data.
- Pilot testing of migration before broader rollout, where appropriate.
- Document the full migration process and expected outcomes and issues.

12. Preferred Technology Stack

SPREP recommends the use of modern, widely supported, and maintainable technologies. The following stack components are preferred and may be used in combination:

Drupal 11+ (PHP 8.4+, Nginx, MariaDB)

Python 3.6+

Node.js 24+ (with modern frontend frameworks such as React or Vue)

Web APIs (JSON:API or GraphQL)

Containerised deployment (Docker / Docker Compose)

Cloud infrastructure (e.g. AWS or equivalent)

Vendors may propose alternative technologies where appropriate; however, strong justification must be provided, including considerations for maintainability, portability, cost, and long-term support.

13. Training and Support

- Technical administration documentation.
- User manuals and simplified operational guidance.
- Training sessions for SPREP and nominated country users.
- Post-launch support period for stabilisation, bug fixing and clarifications.

13.1 Post-Implementation Warranty and Support

The Developer must provide a minimum 3-month warranty period following final acceptance.

- During this period, the Developer must:
    - Fix bugs and defects at no additional cost
    - Address issues identified during real-world use
    - Provide reasonable technical support and clarifications
    - A portion of the contract value (5–10%) may be retained and released upon successful completion of the warranty period.

14. Qualifications and Experience

- Relevant technical qualifications
- Demonstrated software delivery capability.
- Experience developing maintainable web-based systems and data-driven applications.
- Experience with deployment, migration and backup / restore design.
- Strong ability to work with non-technical stakeholders and translate workflow needs into practical system design.
- Experience in the Pacific region or in culturally sensitive knowledge management environments is desirable.

15. Evaluation Criteria

Criteria	Weight
Qualifications	10%

Relevant Experience & Capabilities	20%
Detailed workplan (including outlines of milestones and delivery timelines)	15%
Technical Proposal and Methodology / Project Management and Delivery Approach	35%
Financial Proposal	20%

16. Budget

Up to USD 60,000

17. Payment Schedule

Milestone	Deliverable	Payment
1	Inception Report and Workplan	30%
2	System Architecture and Design	-
3	Prototype / Initial Build	-
4	Data Migration Framework, Mapping and Testing	30%
5	Deployment Model and Backup / Restore Setup	-
6	Final TKDB v5 System (Production Ready)	35%
7	Documentation, Training and Final Handover	-
8	Retainer	5%

All payments are subject to approval by SPREP upon verification that deliverables meet the agreed requirements.

18. Submission Requirements

- Company profile and relevant experience.
- CVs of proposed personnel.
- Technical proposal and methodology.
- Workplan and implementation schedule.
- Budget / financial proposal.

19. Work Arrangements

The Developer will work closely with SPREP IT and the TKDB team. The work may be delivered remotely, with scheduled consultations and demonstrations as required.

20. Implementation Context

TKDB v5 is expected to support one deployment per country, with a strong emphasis on simplicity, sustainability and long-term country ownership. The selected solution should therefore balance modern architecture with practical support arrangements and clear operational documentation.

Annex A.1 High-Level Overview of TKDB

At a high level, TKDB supports the preservation and application of traditional knowledge related to weather and climate. The system is intended to help countries document knowledge, manage associated access rights, monitor indicators over time and use the information for reporting, communication and future forecast-related activities.

Annex A.2 TKDB Workflow Overview

Collect	Enter	Store	Monitor	Analyse	Forecast	Communicate

This workflow reflects the practical lifecycle of the TK project: knowledge is collected from communities, entered into the system, stored securely, monitored over time and then used to support reporting, communication and future forecast development.

Field interview responses may be collected offline using TKDB v5 forms and synchronised when connectivity becomes available.

Annex A.3 High-Level Functional View

Area	Examples
Core records	Narratives, indicators, monitoring records, other records, media
Reference data	Locations, objects, actions, outcomes, users, groups
Administration	Users, permissions, configuration, country setup
Outputs	Search results, reports, exports, communication inputs

Annex A.4 High-Level Data Structure

Contributor / Community	Interview / Source	Knowledge Record	Indicator / Outcome	Monitoring / Other Records

In TKDB, records are linked through common attributes such as person or community, location, date, indicator and related outcomes. The upgraded system should preserve these relationships while keeping forms and workflows easy to use.

Annex A.5 Migration Strategy

- Extract legacy database content and media files from TKDB v4.

- Map legacy entities and relationships into the TKDB v5 structure.
- Validate record counts, media linkage, permissions and key reference data.
- Pilot the migration and resolve issues before broader rollout.
- Provide a migration report including assumptions, issues and reconciliation outcomes.

Annex A.6 Suggested Deployment Approach

- One deployable instance per country.
- Simple repeatable installation process.
- Country-level branding and configuration without deep code changes.
- Operational guidance for backup, restore, updates and routine administration.

Annex A.7 Current TKDB v4 Technology stack

- Operating System: CentOS 6.x or Ubuntu 16 (VM-based deployment)
- Web Server: Apache HTTP Server with mod_wsgi
- Application Layer: Python 2.6 (Flask framework) with Jinja templating
- Database: PostgreSQL 9.x with PostGIS extension
- Database Extensions: plv8, dblink, unaccent
- GIS/Mapping: MapServer with mapfiles and spatial data layers
- Deployment & DevOps: Ansible, Vagrant, VirtualBox (VM-based provisioning)
- Source Code Management: Gitlab repositories (application and deployment)
- Backup & Operations: Cron-based automated and manual scripts for backup, restore, and updates
- Architecture Model: Standalone virtual machine per country deployment