F.No.-2/8/2016-NSDI

DEPARTMENT OF SCIENCE AND TECHNOLOGY

GOVERNMENT OF INDIA

NATIONAL SPATIAL DATA INFRASTRUCTURE (NSDI)

"INVITATION OF EXPRESSION OF INTEREST FOR A PROOF-OF-CONCEPT (POC) ON GEOSPATIAL CLOUD BASED DATA CENTRE DEVELOPMENT FOR NSDI/SOI"

Department of Science and Technology, Government of India invites Expression of Interest (EOI) for a Proof-Of-Concept (POC) on Geospatial Cloudbased Data Centre Development for NSDI/SOIin sealed envelope at NSDI.

Disclaimer: *This EOI is not an offer by the Office of the NSDI, DST or a tender document but it is an invitation to receive responses from eligible interested parties. The purpose of this EOI document is to provide such necessary information to interested service providers that may be useful to them in formulating their proposals in response to this EOI.*

The Expression of Interest (EOI) is invited from the System Integrators who are solution providers in the specific area of Geospatial Cloud Infrastructure development and implementation. The job includes design, development, implementation and demonstration of POC through suitable infrastructure consisting of hardware and software, management strategy, quality of service (QOS), security, space, air conditioning, power requirement, etc. with one typical use case implementation. Demonstration of POC is expected to help decide sizing specification and other details towards setting up an operational scale Geospatial Cloud Infrastructure for NSDI/SOI.

Interested parties who have valid authorization and also have competence and experience to carry out such work are requested to submit the EOI along with supporting documents in sealed envelopes addressed to the Under Secretary, National Spatial Data Infrastructure, Department of Science and Technology, Ministry of Science and Technology, East Block 7, Level 5, Sector-1, R.K.Puram, New Delhi-110066 so as to reach on or **before 1500 Hrs on 7 July, 2017**. EOI may be dropped at a box at above mentioned address or sent by Registered post/Speed post so as to reach the aforementioned address on or before the said date. If sent by post,

NSDI/DST will not be responsible for any loss or delay in transit.

Background

India has, over the past years, produced a rich "base" of map/ imageinformation through systematic field/ aerial/ remote sensing surveys. Standardized metadata for most of these maps and images have been captured and made accessible through India Geo-portal (https://www.nsdiindia.gov.in) of NSDI to facilitate data discovery and access. Portals of the NSDI Nodal Agencies like Survey of India (Surveykshan), National Remote Sensing Centre (Bhuvan); National Informatics Centre (NIC) (National Data Portal); Forest Survey of India; Geological Survey of India (Bhukosh); Karnataka State S&T Council (KSSDI Portal of Govt. of Karnataka);and Kerala State IT Mission (Govt. of Kerala) etc. have been providing Web Map Services (WMS) and Catalogues for their data sets for human visualization and developing possible GIS applications. Efforts are currently being made by these Nodal Agencies to make interoperable Web Feature Services (WFS) accessible for download of feature data in standard encoding specifications (e.g. OGC's Geography Markup Language) for processing on a GIS Platform. More National and State level geo-portals are likely to emerge in the near future for provision of feature and attribute data services over the web. With web-based data services gradually getting accessible from various agencies, emphasisin NSDI is shifting from enabling 'data' services to 'product' or 'application' services to support provision of GIS products or applications over the web. In the context of the above service-oriented framework and the GIS application requirement of the end users and decision-makers, three of the Cloud's primary modes of usage i.e. Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) are proposed to be used in the development and implementation of Geospatial products and applications.

Technical Specifications

The vendor must have the competence and experience in the development and implementation of a Geospatial Cloudbased Data Centre using state-of-the-art techniques and tools besides the international standards for the job. A specific set of technical specifications for the Geospatial Cloud based Data Centrehas been indicated at **AnnexI**.

Responses to the EOI

Interested parties are expected to send their responses to the above EOI before the due date as per the following broad guidelines/ items:

a) Company Profile

b) Overall approach or method for development &implementation of a Geospatial Cloudbased Data Centrewith use case (application) implementation

c) Suggested Hardware

d) Suggested Software and other utilities

e) Quantity and quality of manpower to be engaged in the development/ implementation

f) The general high level requirement for the Geospatial Cloudbased Data Centreoffering will be based on the following:

- **On-demand self-service:** Services will be unilaterally provisioned by NSDI/SOI
- **Broad network access:** Adequate Internet and Internal bandwidth
- **Resource pooling:**Ability to place the resources on a specific geographical zone
- **Rapid elasticity:** Near real-time service provisioning and de-provisioning times
- **Service measurement:** Visibility for the different types of services via dashboardor web based console
- **Service Management and provisioning:** Explicit service specific SLAs for each of the offerings along with disaster recovery capabilities and data isolation mechanisms
- **Service Accounts:** Support for multiple users with a customized portal view for each
- **Service Management:** Secure web based management console available for all services. Remote OS level access (RDP, SSH) for the virtual machine instances

g) Any other facts/ items if need to be mentioned.

Any further information/clarification in respect of this EOI may be sought from Sri Dharmendra Singh, System Analyst, National Spatial Data Infrastructure (NSDI),East Block-7, Level-5, Sector-1, R. K. Puram, New Delhi using the e-mail (Nirmlendu.kumar@nic.in).

8/6/17

(AgusthiaMinj)
Under Secretary to the Government of India
Ph:011-26182973

Annex-1

DEVELOPMENT AND DEMONSTRATION OF A PROOF-OF-CONCEPT (POC) GESOPATIAL CLOUD BASED DATA CENTRE FOR NSDI/ SOI: SPECIFICATIONS

The following are the broad components and use case specifications for the development and demonstration of a proof-of-concept (POC) Geospatial Cloud based Data Centre for provisioning of spatial data and application services:

Components:

- **Infrastructure:** Servers/ Network/ Storage etc.
- **Software:** Operating System/ Hypervisor / Web Server/ Spatial Database/ Geospatial-server etc.
- **Management/ Quality of Service (QoS)/ Security:** Admin console/ Dashboard/ Concurrent users/ Response time/ Security levels/ Audit trails/ RBAC etc.
- **Space / Air-conditioning / Power requirements**

Typical Data Set and Use-Case Specifications

1. Scope of the area of interest and GIS operationsis restricted to the data sets of Varanasi City of Uttar Pradesh having the following details:
   a. Area of interest (AOI) covered under NUIS project for the City is 100 Sq. km (Urban Land Area 104.82 Sq. Km) and current extent of city area could be 200 Sq. Km.
   b. Number of house hold is about 1.5 lakh in Varanasi.
   c. Imageries, photographs, and topographic sheets of the area are available/ accessible for integration with the above high resolution data.
2. GIS-ready digital data is of 1:2000 Scale on UTM projection and WGS 84 datum.
3. Existing data is as per SOI NUIS data model.
4. The existing data is to be upgraded with additional content to the topographical data model and 3 D City data model up to LOD-3 (for selected area), with appropriate methods to achieve standards and accuracy requirements.
5. UML diagram for the entire topographical data is to be drawn with tools like Altova XML Spy and/ or Enterprise Architect.

6. Schema so drawn is to be translated to a relational database using Oracle Spatial defining tables, primary key, foreign key etc. as per the above UML diagram.

7. Digital data available as final product should be ported to Oracle spatial tables by proper tools like FME in order that a standard operating procedure could be defined for operational scale implementation of the database for larger data sets.
8. The above data available in Oracle tables are to be published as OGC web services like WFS, WMS, WCS, CSW and WPS from the Geospatial Cloud proposed to be established at Hyderabadcampus of SOI. National Open Government Data Portal (https://data.gov.in) and Surveykshan Portal (http://www.surveykshan.gov.in) of Survey of India should be made accessible to this POC cloud for possible implementation of comprehensive use cases for Varanasi City. Proper Registry mechanism as envisaged in the NDR scope of work of NSDI should also be available for registering the Geospatial data, services, and development of GIS applications.

9. The data so published should be available for viewing in mobile devices with proper security rules / guidelines of Government of India and the State Governments. Map Transaction Registry (MTR) should also be maintained. Once a data set is downloaded, the system should be in a position to track the data handling/value addition/ data misuse etc. till deletion of this data from the system.

10. The data should also be accessed by authorized officials / staff from NSDI/ SOI or any other agency as per requirement using well-defined access rights to be provided by NSDI/ SOI. For such activities,adequate security provisions up to feature level should be maintained as a part of the data and metadata. The protocol used should be WFS-T or Oracle's proprietary protocol, whichever is most efficient for the purpose.

11. For Web publishing, the symbol set should be used as per standards and practices followed by Survey of India or any other agency accepted by Survey of India.

12. Hardware, software and portal with applications to be upgraded as per the requirement of the cloud.

13. All digital data of 1:50,000 sheets of the study area should be re-engineered and put into oracle data base for OGC web service publication.

14. Seamless integration of this re-engineered datasets with the high resolution data sets indicated above should be ensured.

15. The complete process of printing GML files into cartographic products like topographic sheets should be demonstrated.

16. The 3D city features available in high resolution urban information systems should be made accessible as CityGML files and rendered as printable/ displayable products for the end users.

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