

Status of Thailand's Geospatial Data Infrastructure and Systems (National Geo-informatics Infrastructure Service: NGIS Map Portal)

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4. Other major projects

Background on Thailand's geo-spatial Data Infrastructure/Services (National Geo-informatics Infrastructure System: NGIS Portal)

Geo-spatial data and mapping related organizations in Thailand

More than 20 organizations / agencies, > 130 years

Public services/Government offices

- Royal Thai Survey Department
- The Department of Lands
- The Hydrographic Department: Navy
- Land Development Department
- Local Administration Authorities:
 - Bangkok Metropolitan Administration
 - Sub-district Administration Authorities
- The Royal Forest Department
- More....

State enterprises

- Metropolitan Electricity Authority
- Provincial Water Work Authority
- Industrial Estate Authority of Thailand
- More....

Public organizations

- GISTDA
- HAI
- More....

More than 200 Layers/Datasets



Examples of Thai Government Mapping related Agencies/Geo-spatial data makers

	Small Scale (<1:50k)	Medium Scale (1:10k-50k)	Large Scale (> 1:10k)
Royal Thai Survey Department	Topographic maps		Topographic maps
	Geodetic reference		
The Hydrographic Department	Nautical charts		
The Department of Lands			Cadastral maps/Aerial photos
The Department of Public Works and Town & Country Planning		Principle City Plan	Land use / Building use
The Land Development Department	Land use		Aerial photos
GISTDA	- Satellite/Aerial/UAV image maps - Thematic & line maps from satellite images by order		
The Royal Forest Department	National forest		



National Committee on Geo-information (Current)

Chairman:	Prime Minister / Deputy Prime Minister
1st Vice Chairman:	Minister of Science & Technology
2nd Vice Chairman:	Minister of Digital Economy
Members:	6 Permanent Secretaries of Ministries, Director of Bureau of Budget,
Member:	Secretary General of The Office of NESDB, 5 Directors-General of Departments, <= 10 professionals advisors
Member & Secretary:	<i>Permanent Secretary of Minister of Science & Technology</i>
Member & Assistance Secretary:	<i>Executive Director of GISTDA</i>
	<i>Total 18-28 members (Appointed on 13 September, 2015)</i>

1. Suggesting to the cabinet for approval and imposing policies on
 - Management and administration of national geo-information infrastructure system and services, and geo-spatial data.
 - Protocols for geo-spatial data and services operation for related bodies. These include laws, and regulations
2. Monitor and suggest on integration of government geo-spatial data and geo-information projects
3. Imposing geo-spatial data, remote sensing standard, and services in order to reduce duplication, enhance data sharing and interoperation integrate the information to be exchanged are also their duties.



**Bilateral / Multi-lateral
entities cooperation**

Cooperation/Collaboration under laws/regulations/committees

MOU: MICT, DOL, CSRS
MOU: GISTDA, RID, DOAE
,RD, OAE
MOU: GISTDA, KU
MOU: MWA, GISTDA

National Committee on Geo-information (NCGI)

Steering committee on Master Governmental Data Integration (Digital government plan)

*Base data on
citizen and
governmental
services*

*Base data on National and
public security*

*Base data on water and
weather and climate*

*Base data on Natural
resources and governmental
infrastructure administration*

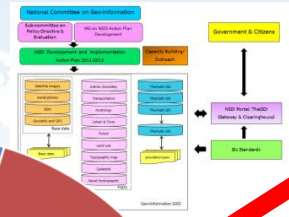
Commission on “ONE MAP” – Readjusting state and public lands boundary.

Committee on Surveying Standards

Development of Thailand National Spatial Data Infrastructure/Service

More than a decade (since 2003) under National Committee on Geo-information (NCGI)

14 NCGI Standards



Master plan / Activities (2011-2015)

- Meeting / Seminar / Pilot projects /
- Capability building / Promotion

Laws / Regulations

MOU / WG / Laws / Regulations

FGDS (13 Groups)

Thai SDI (Clearinghouse & Gateway)

SW/Script/Handbook



	Layer Groups	Main producers
1	Ortho-Aerial Photos	Royal Thai Survey Department (RTSD)
2	Ortho Satellite Images	GISTDA
3	Geodetic Control Marks and other Control Points	RTSD
4	Digital Elevation Models	RTSD / Land Development Department (LDD)
5	Administration Boundaries	Department of Provincial Administration
6	Transportations	Ministry of Transport
7	Water body	Department of Water Resources (DWR)
8	Built-up and Urban related data	Department of Civil Works and Town and Country Planning
9	Land use / Land cover	LDD
10	Forest	The Royal Forest Department
11	Topographic Maps (Raster)	RTSD
12	Land Parcels	Department of Lands (DOL)
13	Hydrographic Maps	Hydrographic Department

National Geo-information Master Plan (2017-2021)

National Geo-information Master Plan

<p>Advancement in IT&GIT</p> <p>IoT / Web2.0 / Data storage / GNSS / Spaceborne & Airborne data scquisition (LiDAR, Drones) / Map Services / Open data</p>	<p>Development Plans and Administration</p> <ul style="list-style-type: none"> - Draft of Constitution of The Kingdom of Thailand - National Strategic Plan (20 Years) - National Social & Economic Development Plan (12) - Digital Economic and Social Development Plan - E-Government Development Plan - Thailand 4.0
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National Geo-information Master Plan (2017-2021: Draft)

Strategies

Amendment of Laws / Rules / Regulations

Master Geo-spatial Data and Services for Government Sector Use

Geo-spatial Data and Services for Public Use

Improve Human Capability on GI & Promote use and applications on GI

Action Plan / Projects



Contact person:

Ms, Chuthamart Panklin, Chief of Fundamental Spatial Infrastructure Development Division, GISTDA, Chuthamart@gistda.or.th

Action Plan for 2017 (Secretary of NCGI: Ministry of Science & Technology)

1. Issuance of National Master Plan on Geo-information (2017-2021)

2. National Master Geo-information Service & System Development Project (2017)

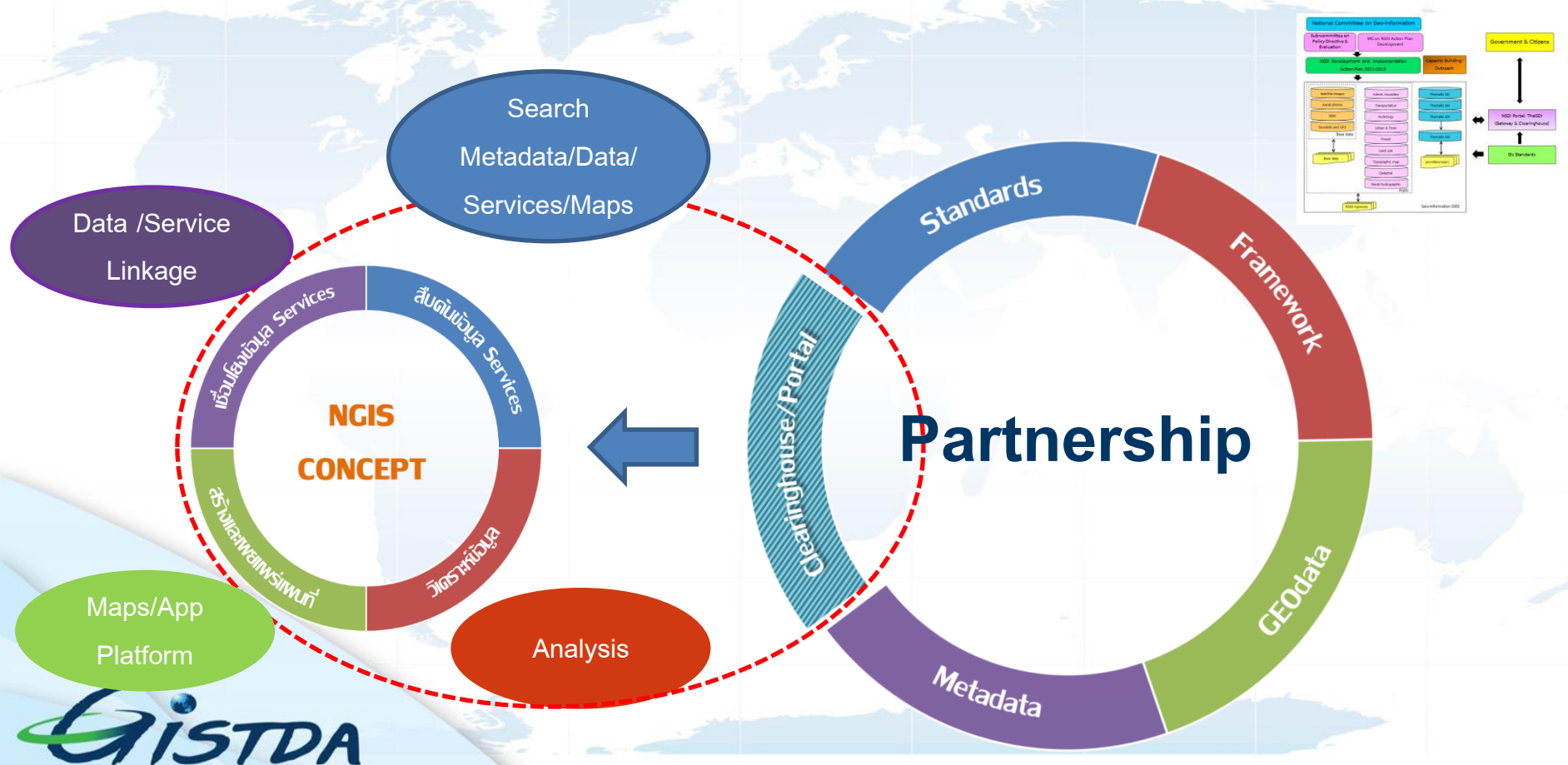
2.1. To promote FGDS standard for data sharing (15 Provinces)

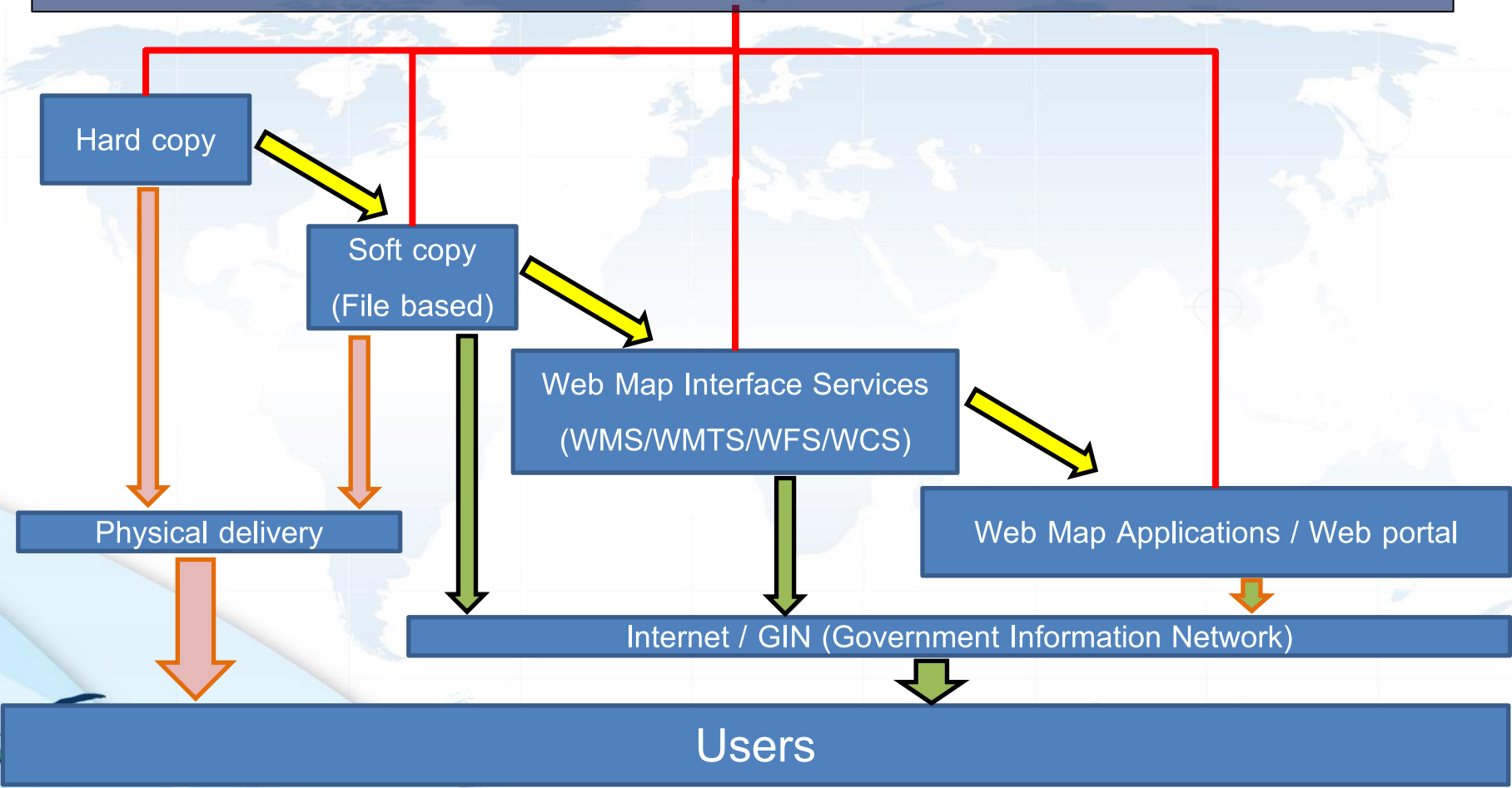
2.2. National Geo-informatics Infrastructure System: NGIS (Procurement & Application Development)

2.3. To promote and facilitate utilizations of NGIS Portal for Country's Development



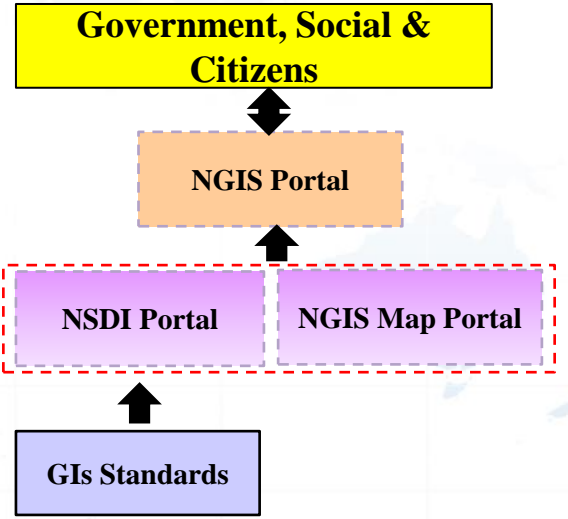
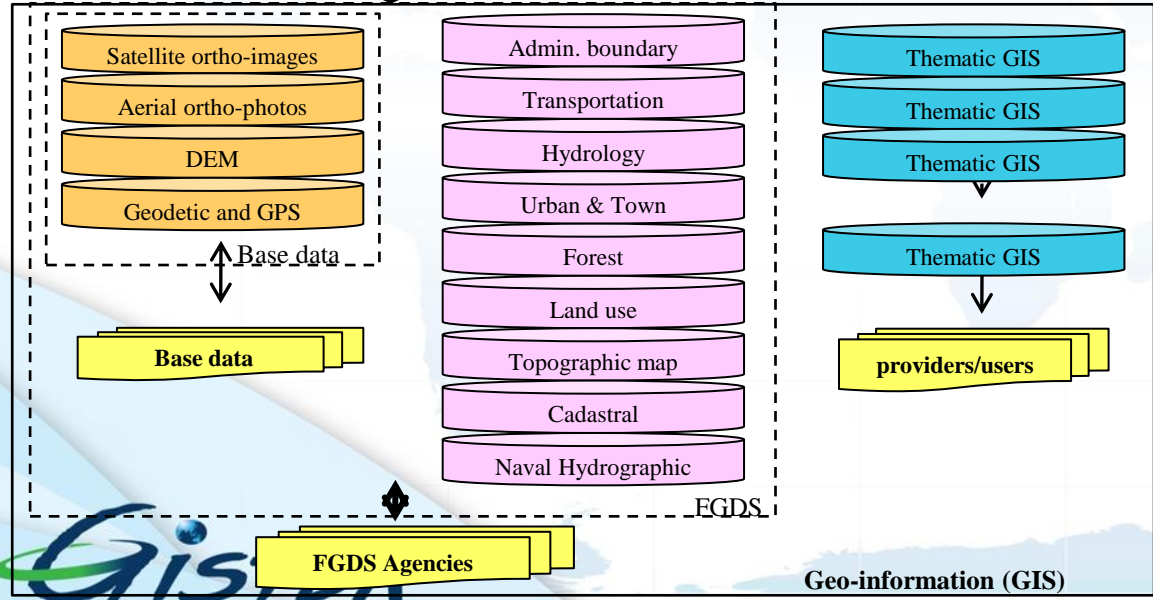
Development of National Geo-informatics Infrastructure System (NGIS Portal)







Thailand's NSDI Development and Implementation Framework



2011-2015

Thai SDI

(Clearinghouse & Gateway)

- Collection of data (FGDS)& metadata
- Data metadata stored & map service from ThaiSDI
- FGDS
- Map viewing
- Search data / metadata
- Open source software (GeoServer & GeoNetwork)
- Public
- 1 Server (DB/App)

2016

NGIS Map Portal Demo

(hosted by GISTDA Portal)

- Demonstration (GISTDA's system)
- Focusing on linking map services from other organization & provide map services(WMS/WMTS/TMS)
- FGDS ++
- Focusing on "Found and Use"
- Searching data/metadata/map services/ maps
- Commercial software (Portal for ArcGIS & GeoPortal)
- Government use
- *Virtual machines*

2017

NGIS Portal

- National system / service
- Focusing on linking map services from alliance organizations & provide map services (WMS/WMTS/TMS/WFS/CSW) & *platform for application development*
- FGDS++
- Focusing on "Found and Use (analysis & solution for DSS)"
- Searching data/metadata/map services/ maps
- Commercial software (Under procurement process)
- Government use
- *Cloud servers (EGA)*

NGIS Portal

NGIS Portal

- National GIS Portal that can provide all types of data and service (OGC Web service).
- Also, Metadata servicing, data analyzing (Web Processing Service) , Map creating, application developing on portal
- FGDS of all Thailand in 2019
- The development of NGIS Portal is an ongoing process and it will be implemented in 2018

NGIS Map Portal



NSDI Portal



NGIS Map Portal :

- Established under Roadmap of integrated the utilization of mapping, satellite image and remote sensing
- Implement from the government policy
 - Statement of the Prime Minister on 6 January 2015
 - Cabinet resolution on 20 January 2015
- Provided all types of data and service (WMS, WFS, and WCS).
 - Data service in WMS (start in 2015)

NSDI Portal :

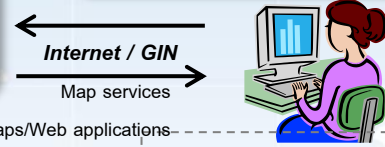
- Establishment of NSDI portal, as a national gateway and clearinghouse for GIS, which will include OGC compliant Web-services such as WMS, WFS, WCS and WPS.
- Implement from National Committee on Geo-information, in 2003
- Provided standard of data service for FGDS data or other data service that produce by GI Standard or FGDS Standard in OGC Service, include metadata service.
 - Data service in WMS and metadata (start in 2011)
 - FGDS available on NSDI portal in OGC Service (1 province in 2016, 15 provinces in 2017)

NGIS Portal

Search/Share: Metadata/Data/Map services/Web map applications

Platform: for maps/customized applications/analysis

Users: Government agencies



- Map viewers
- Map publishers
- Group administrators
- System Administrator

Internet
GIN

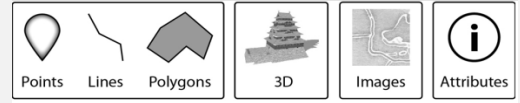
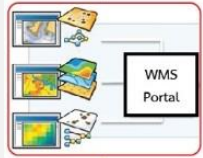
WMS/WMTS/TMS
WFS
WCS

Data / Services from custodians

Service/
Data
Providers



Web Map Service Interface
WMS / WMTS / TMS
WFS
WCS



FGDS ++ Monitor data/ Near real time / Social /
Sensors Data Crowd Sourcing data



GIS Server [Portal]

OS: Windows Server 2012 R2
 Datacenter
CPU : 6 vCPUs
RAM : 32 GB
HDD : 100 GB for OS
 1 TB for Data

Software :
 - ArcGIS 10.4 for Server Advance
 Enterprise
 - ArcGS Datastore 10.4

GIS Server [Web] x2

OS: Windows Server 2012 R2
 Datacenter
CPU : 4 vCPUs
RAM : 32 GB
HDD : 100 GB for OS

Software :
 - ArcGIS 10.4 for Server Advance
 Enterprise
 - ArcGIS 10.4 Image Extension for
 Server
 - ArcGIS 10.4 Data Interoperability for
 Server

GeoPortal Server

OS: Windows Server 2012 R2 Datacenter
CPU : 4vCPUs
RAM : 16 GB
HDD : 100 GB for OS
 200 GB for Data

Software :
 - GeoPortal 1.26

Share Server

OS: Windows Server 2012 R2
 Datacenter
CPU : 4 vCPUs
RAM : 32 GB
HDD : 100 GB for OS

Database Server

OS: Windows Server 2012 R2
 Datacenter
CPU : 4 vCPUs
RAM : 32 GB
HDD : 100 GB for OS
 3 TB for Data

Software :
 - PostgreSQL 9.3.5 (64 bit)

Web Server

OS: Windows Server 2012 R2 Datacenter
CPU : 4 vCPUs
RAM : 32 GB
HDD : 100 GB for OS
 1 TB for Data

Software :
 - ArcGS webAdaptor 10.4 for portal(Portal)
 - ArcGS webAdaptor 10.4 for server(arcgis)
 - ArcGS webAdaptor 10.4 for server(data)
 - Portal for ArcGIS 10.4

Proxy

OS: Windows Server 2012 R2 Datacenter
CPU : 2 vCPUs
RAM : 16 GB
HDD : 100 GB for OS

Software :
 -

Backup Server (Existing)

OS: Windows Server 2008R2 Enterprise
CPU : E5-2450 V2 * 2 cpu
RAM : 32 GB
HDD : 300 GB for OS

Software :
 - IBM Spectrum Protect

GIS Server [Cache]

OS: Windows Server 2012 R2 Datacenter
CPU : 4 vCPUs
RAM : 32 GB
HDD : 100 GB for OS

Software :
 - ArcGIS 10.4 for Server Advance Enterprise



Other Major Projects

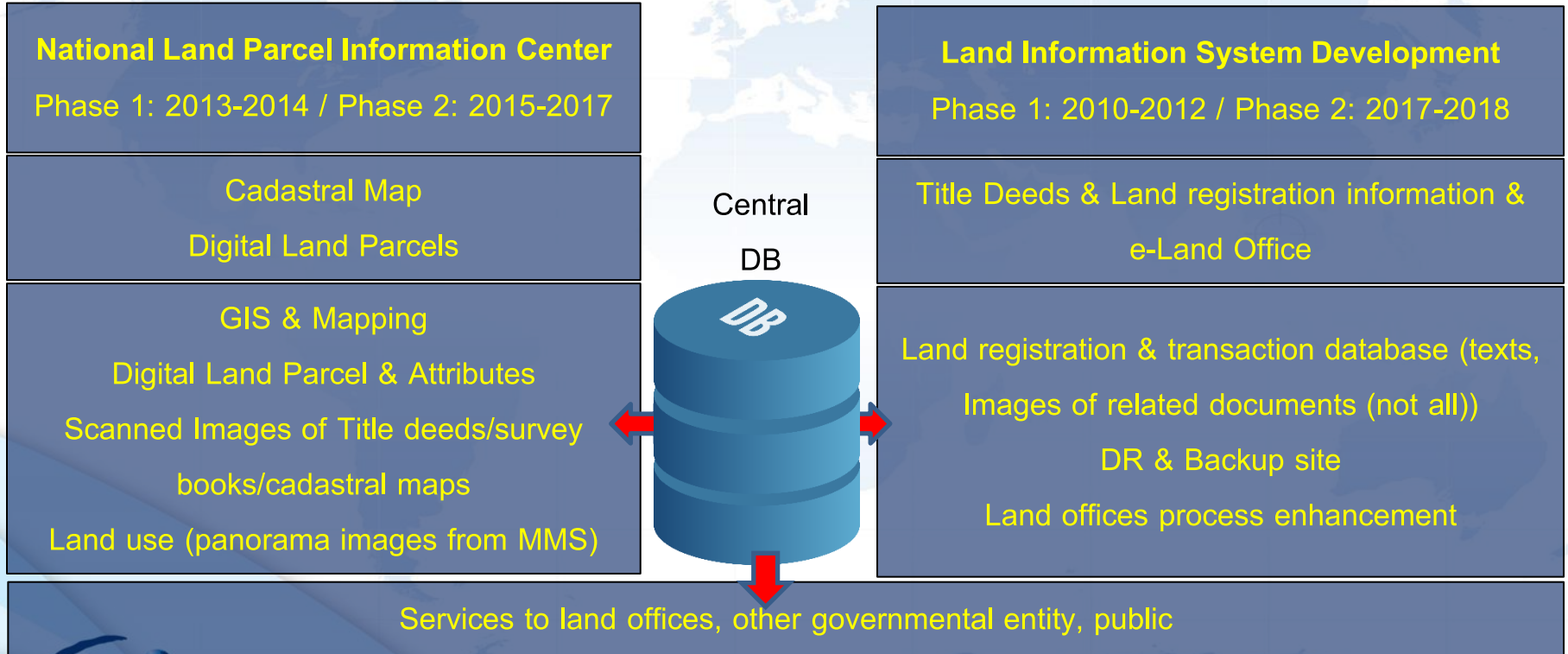
Land Information System & National Land Parcel Information Center Project: DOL

Local Geoid Model Development: RTSD

GNSS CORS: DOL & RTSD

Land Information System Development & National Land Parcel Information Center Project

E - Department of Lands / Land Information System



Contact person:

Mrs. Tuangrat Chantarapradit, Director of Computer System Division, Information Technology Bureau, The Department of Lands

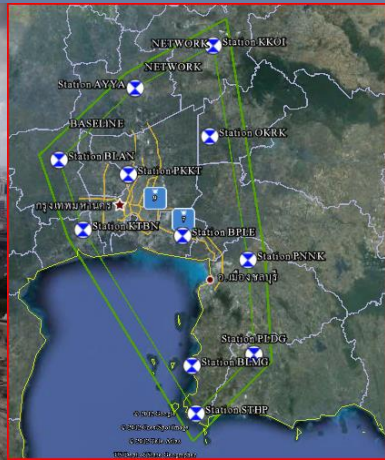
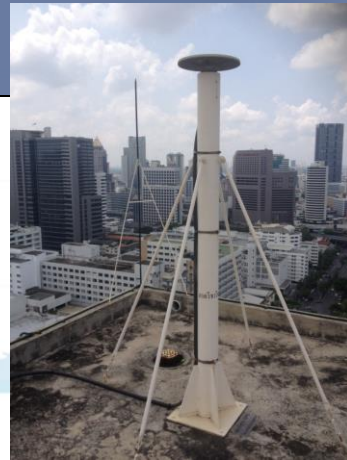
GNSS CORS : Continuous operating Reference Stations

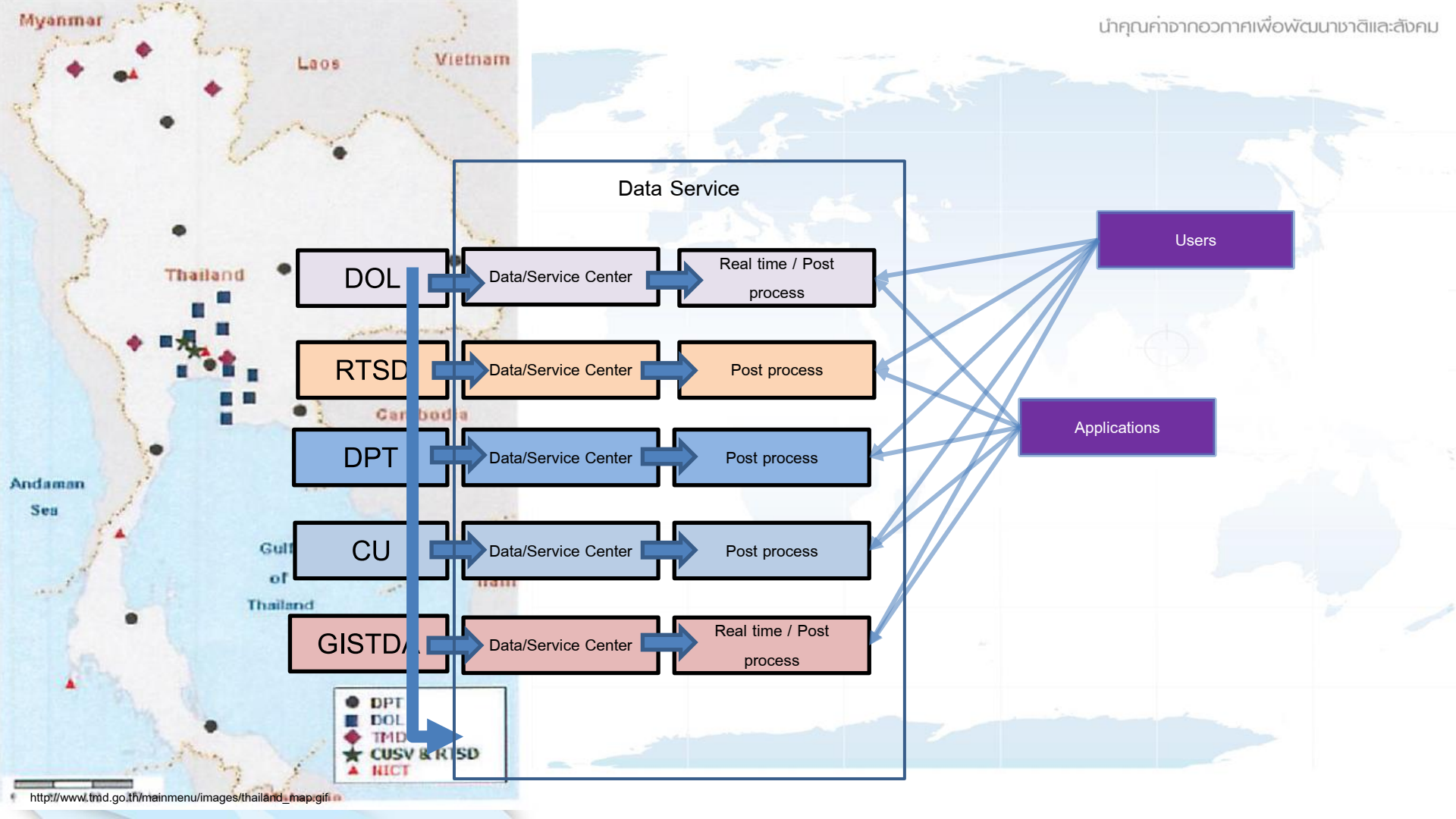
Background: Has been installed more than 10 years by at least

- The Department of Lands (DOL) : Mapping & Cadaster surveying, 11 stations (VRS)
- The Department of Civil Works and Town Plan (DPT): Mapping, 15 stations
- Royal Thai Survey Department (RTSD): 1 station, Geodetic and terrestrial frame reference
- Chulalongkorn University, Department of Survey Engineering: 2 Stations, Research
- GISTDA : Research & applications, 3 Stations

Coverage: Not well distributed

Service : Individually





GNSS CORS : Continuous operating Reference Stations

Current status (2015-2017): 2 major projects to establish and operate CORS in Thailand

- The Department of Lands (DOL) : Mapping & Cadaster surveying, 11 stations **+110 stations** (VRS), Installation has begun, 50 stations will be installed by 2016, the remaining will be done in 2017
- Royal Thai Survey Department (RTSD): 1 station, Geodetic and terrestrial frame reference **+ 80 stations, *Pending due to procurement process.***
- : Several minor projects
 - GISTDA, Research & applications, 3 Stations + 2 stations
 - Department of Disaster Prevention and Mitigation (DDPM): 6 stations
 - etc.

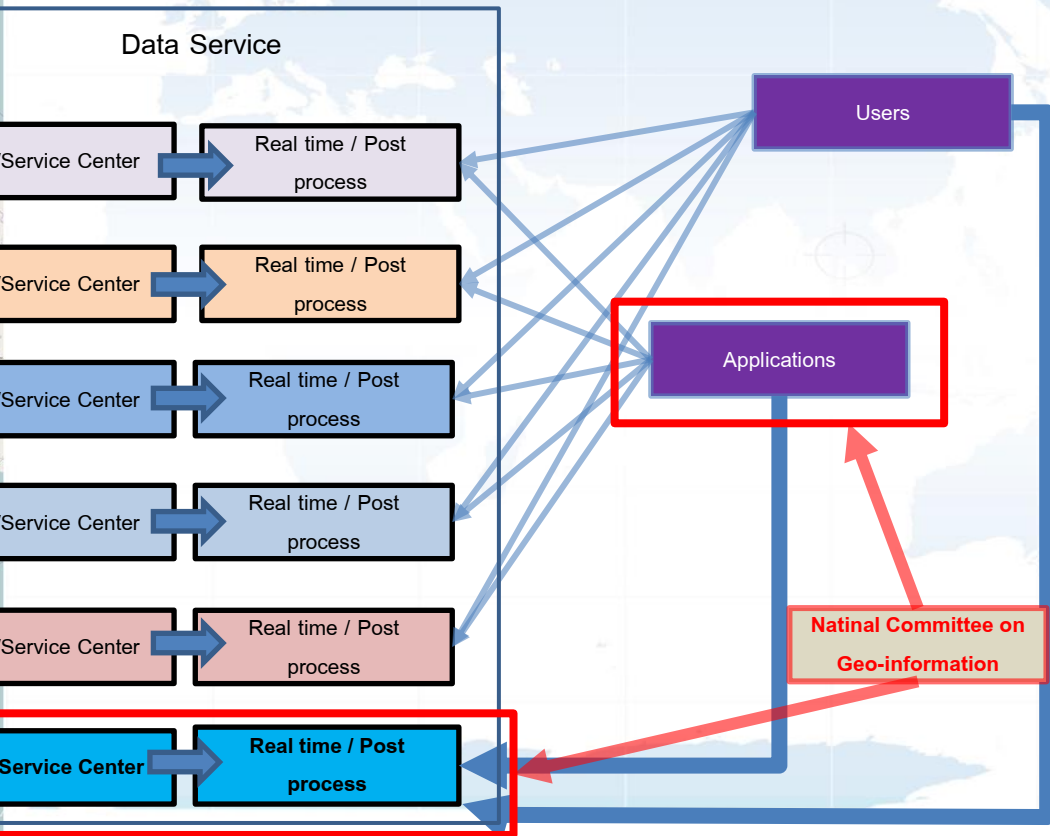
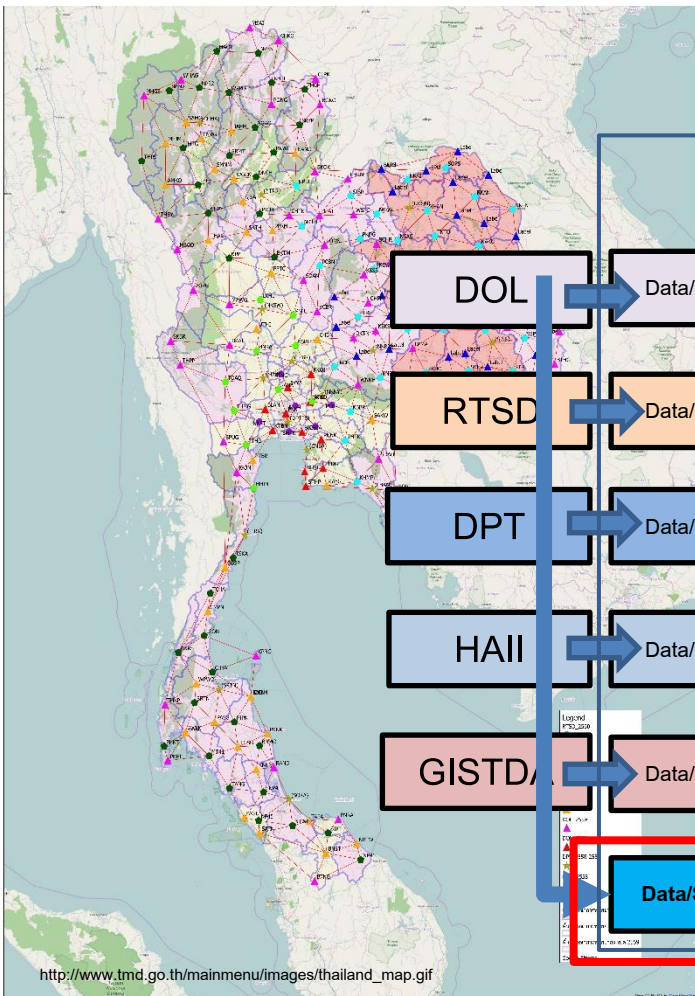
Coverage: Across the whole country (210 stations++)

Services of CORS: 1) Observation data of the stations, 2) Real time differential data service

Service & Data Center: DOL, and ++TBD

Challenge: To make both government and public gain benefits and make CORS service worth the investment.

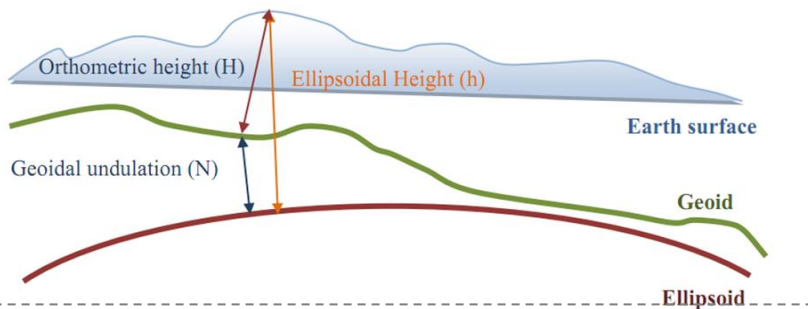
To integrate data & service from an single individual system to serve as one



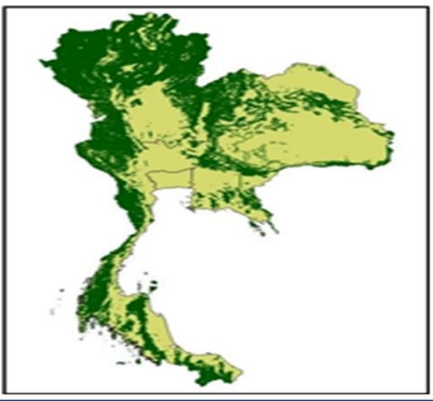


2. By Royal Thai Survey Department – Chiang Mai Uni.

High Precision Local Geoids Model for Thailand



Damrongchai P., Promthong C, 2016



RTSD & CMU

2015 - 2017

- Col. Chaiwat Promthong, RTSD
- ASST Professor, Puttipol Damrongchai, Ph.D., CMU

Output

- High precision local geoid model
- Accuracy of DTM from the geoid model better than 10 cm (Average)

Thank You for your attentions !!!
Any questions ??