

Wildlife Surveillance and Anti-Poaching System (WS&APS)

Department of Information Technology & Communication(DOIT&C)

Jaipur, Rajasthan

Rajasthan Forest

Forest Area: 32830 km²
Reserve Forest: 12252 km²
Protected Forest: 18482 km²
Unclassified Forest: 2096 km²

Forest Cover: 16572 km²
Tree Cover: 8266 km²
Wildlife Area: 9860 km²

Wildlife & Forest Conservation

3 Tiger Conservation Reserve
2 leopard Conservation
Reserve

3 National Park
26 Wildlife Sanctuaries
13 Conservation Reserve
5 Zoo

- Forest Conservation and Development
- Wildlife conservation and Development
- Protection and Development of Bio Resources
- Control on Desert Spread
- Efforts to control environment & climate change through Forest Resources
- Soil and Water Conservation
- Continuous Forest Management

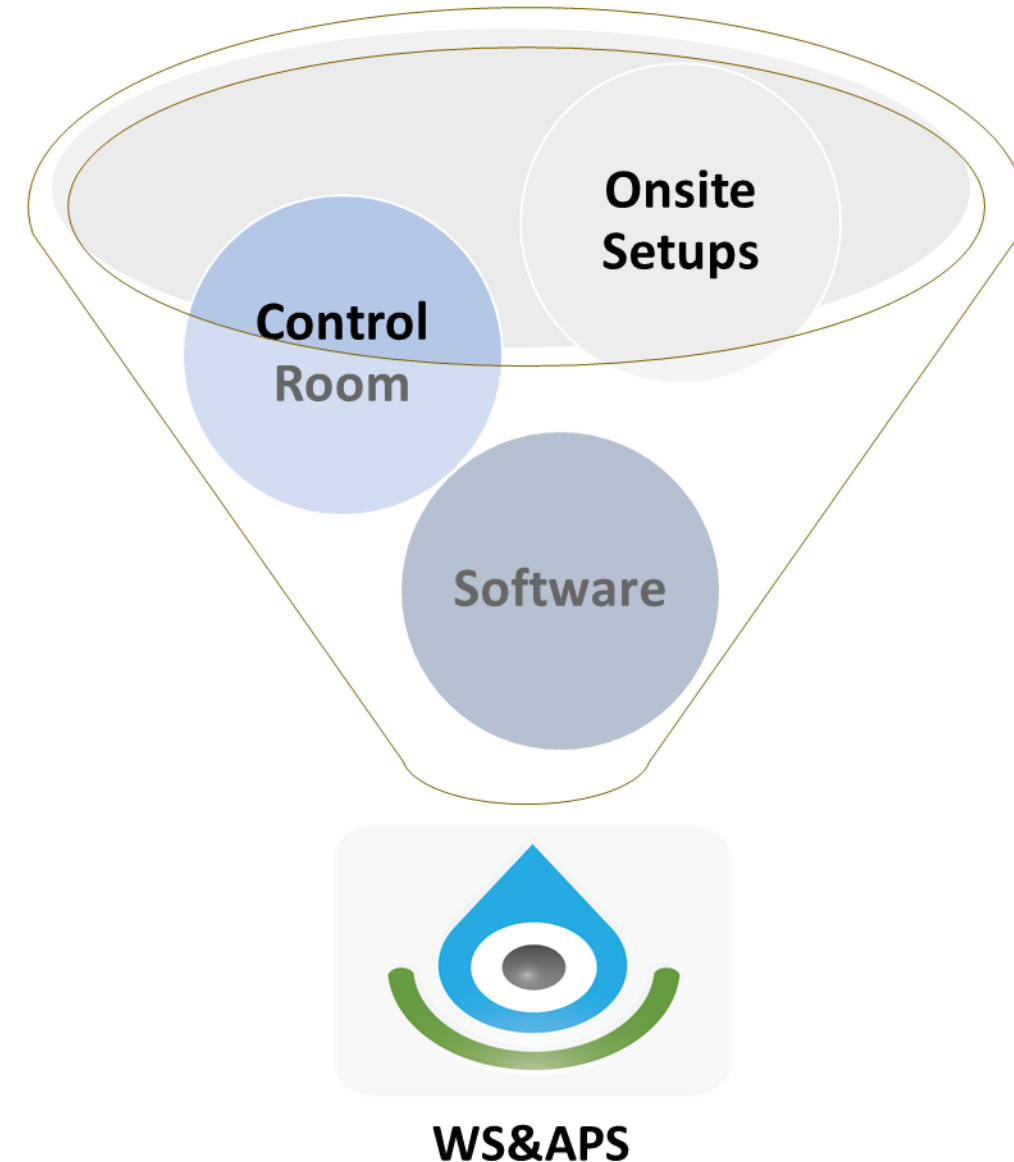
Key Challenges



WS&APS- Broad Overview

An integrated surveillance solution equipped with thermal/optical cameras, wireless network equipment, solar power systems, drones etc. in hybrid model as follows:

- **Onsite Setups:** : Tower/Pole, Thermal & Optical cameras, Radio setup, solar solution, aviation light, switch etc.
- **Local Control Room Setup:** Modular Container, PAC, Servers, Storage, Switches, Router, Displays, Computers, Comfort ACs, Workstation cabinets, DG Sets etc.
- **Software/ Applications:** VMS, CCC, Analytics, ML/AI, helpdesk etc
- **Miscellaneous Components:** Base Radio Station, Digital Radio Handset, ROIP, UAVs
- **Integrations:** Raj SSO, FMDSS, e-Sanchar, Rajdhaara etc.



WS&APS- Objectives & Key Features

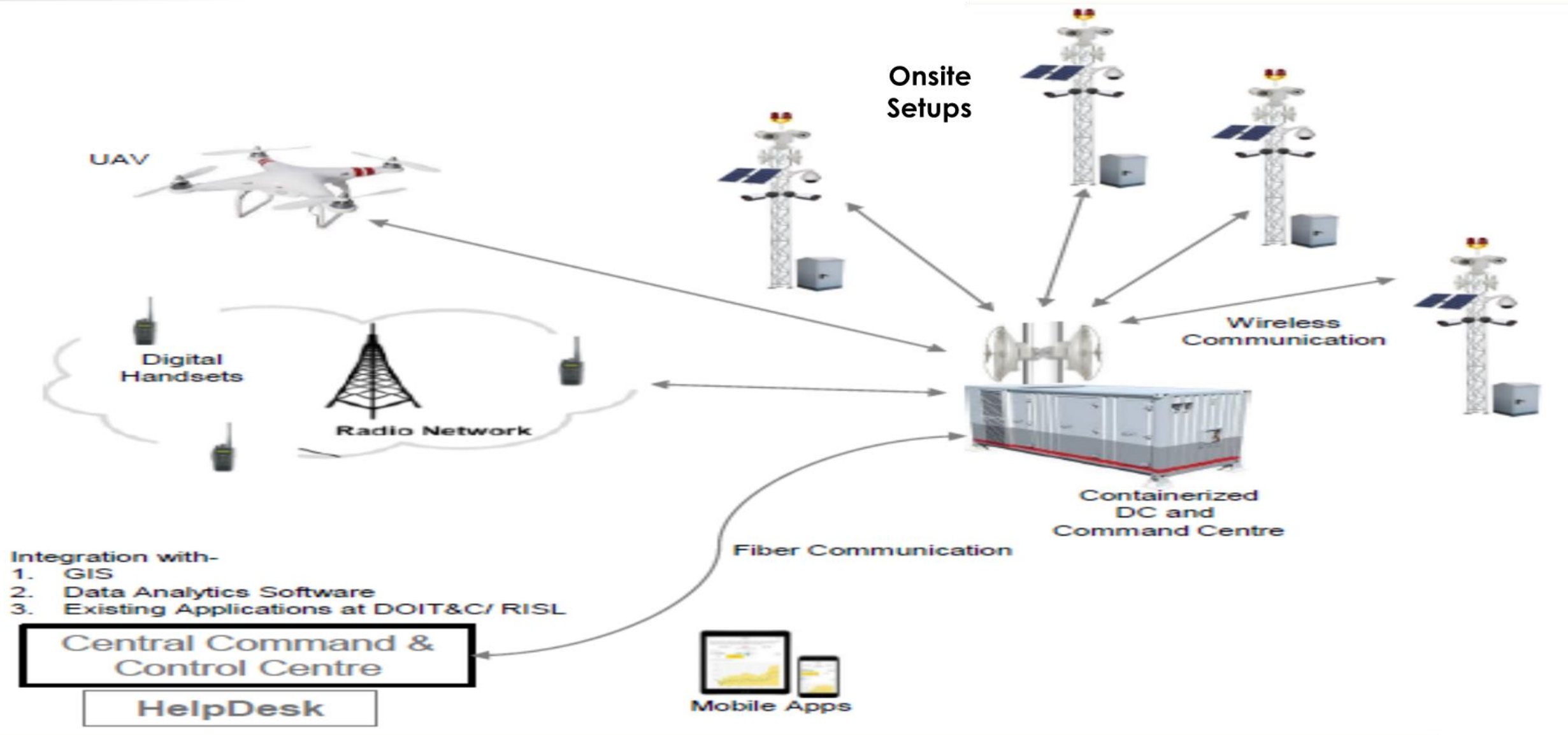
Objectives

- Establishment of a 24X7 surveillance and anti-poaching system
- Automated monitoring of tiger or other identified wildlife species movements
- Significant Improvement in efficiency of response / rescue of any Wildlife Crime/ Animal respectively
- Strengthen prevention response mechanism against Wildlife/ Forest Crime
- System driven analytical reports for improvement operational level efficiency and effective decision making

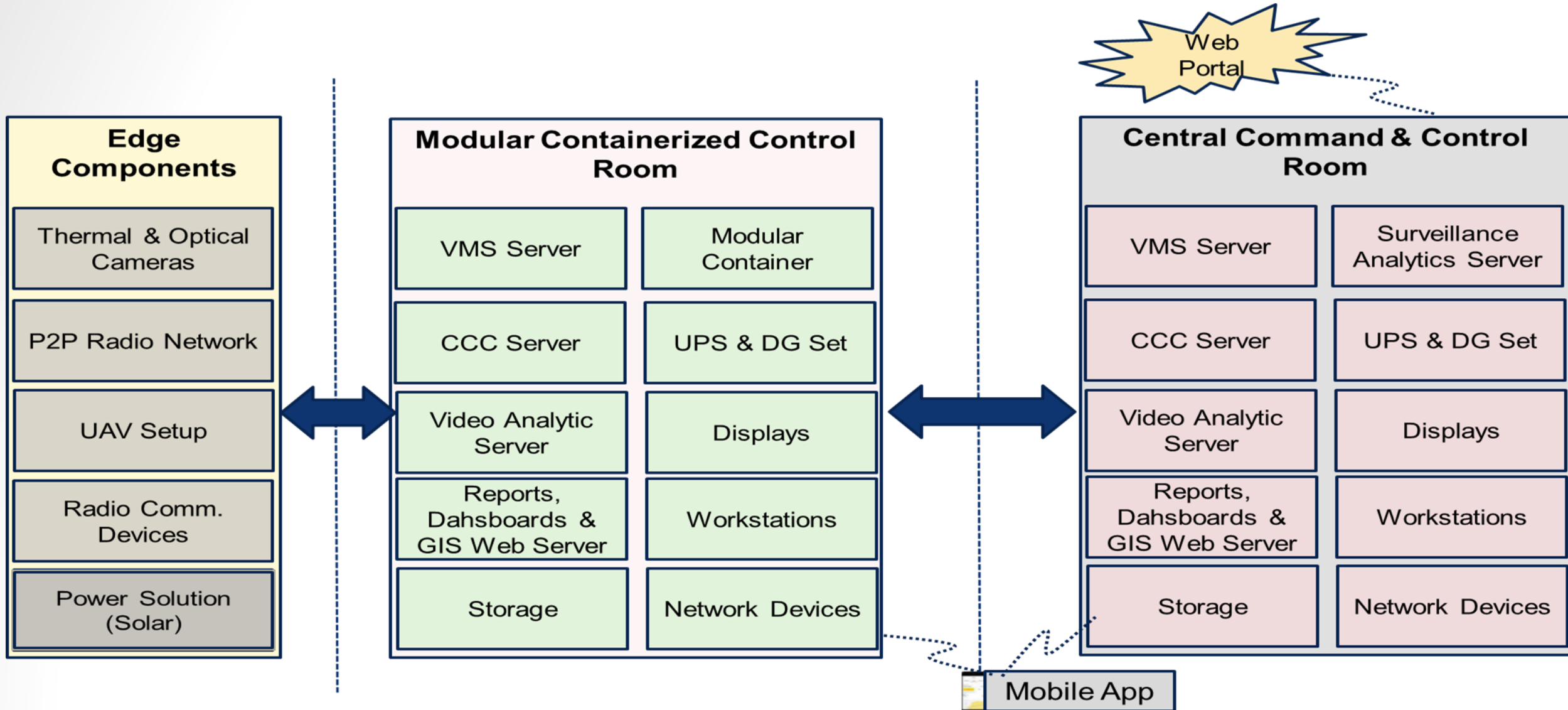
Features

- Live Feed of the tiger/ panther/ leopard/ other reserve.
- Graphical Alerting on geo maps.
- Remotely controllable camera operation.
- Point to Point secure wireless connectivity.
- Surveillance Dashboard showing health of installation.
- Alerting Cycle with Details on actions taken on the Web application.
- Approximate Geo Position of the alert at that moment i.e. the current camera position.
- Scenario creation for custom tour of thermal/visible sensors based on bookmarks.

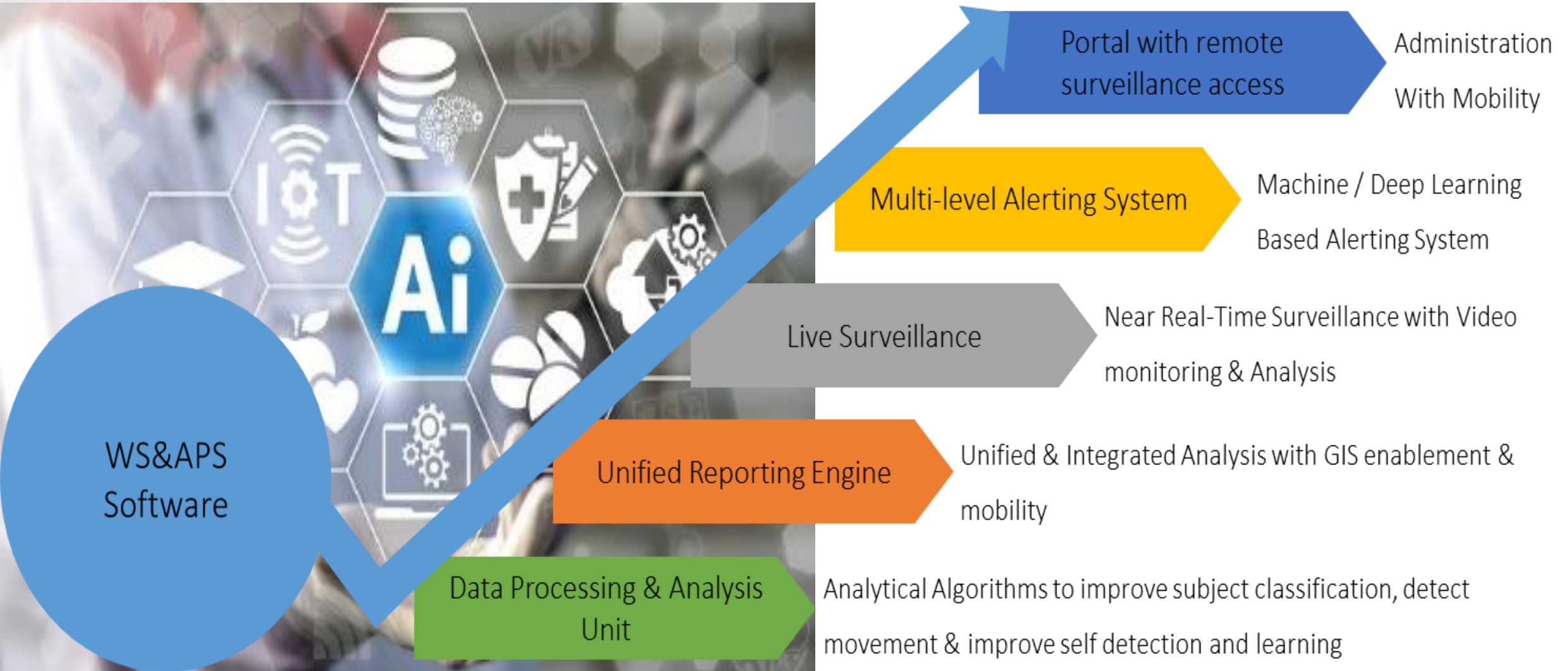
Deployment Layout of WS&APS Solution



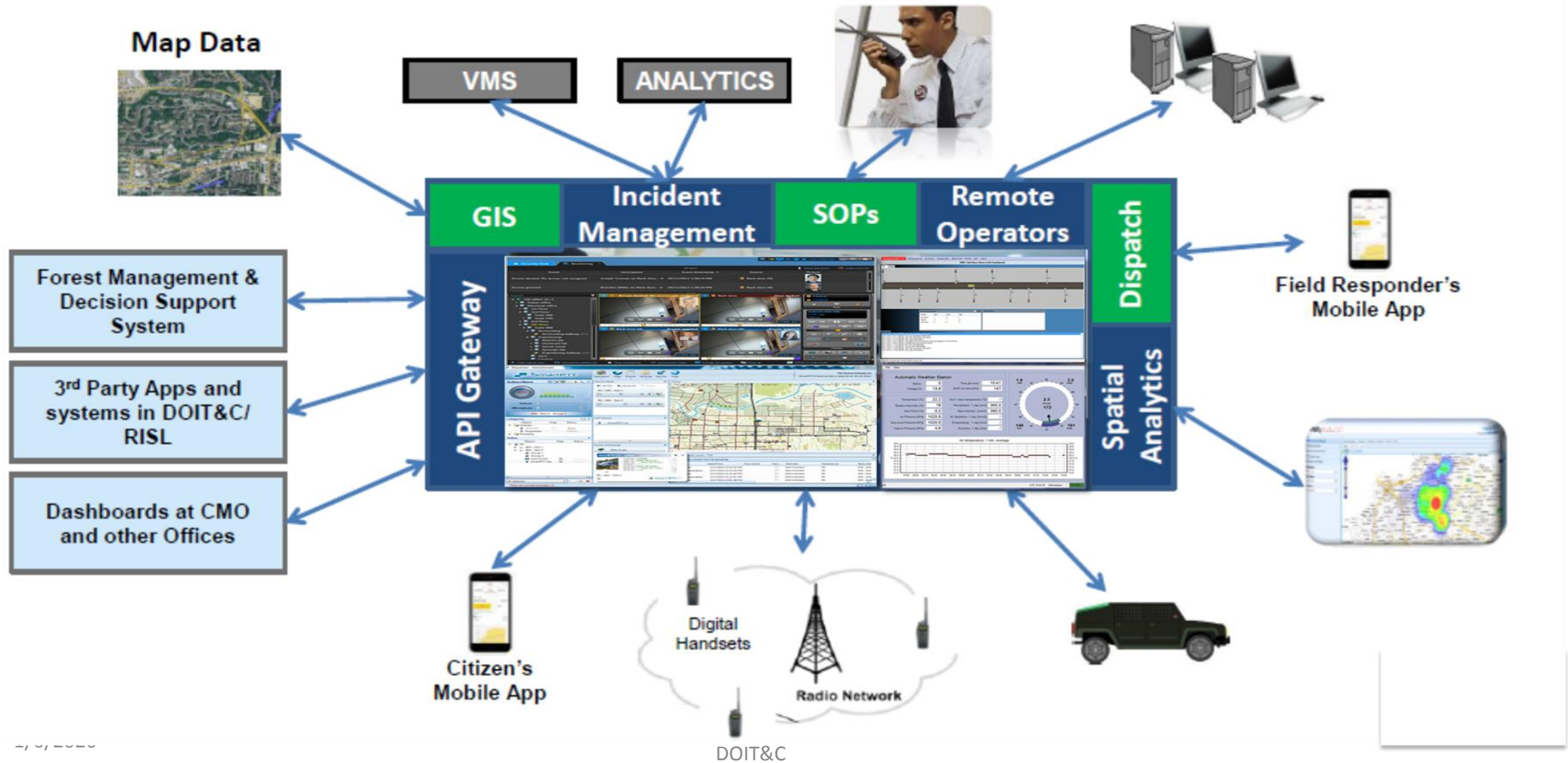
IT & Non-IT-Infrastructure Components



WS&APS Software Components



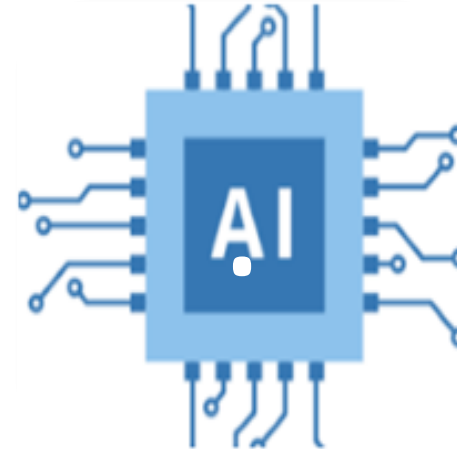
Components of Command Control Suite



Emerging/ Innovative Tools

Internet of Things

- Live feeds & Pan – Tilt – Zoom Control of IP Cameras
- SMS alerts on incidences/ alarms to mobile phones & Digital Handsets



Artificial Intelligence

- Species tagging, recognition, pattern analysis etc.
- Anomaly movement, Critical path optimization etc.

Modular Containerized DC and Monitoring Room

- DC Farm to store, process and monitor alerts/ feeds
- BMS system to keep secure installed equipment



Unmanned Aerial Vehicle

- Mission Planning, Control and Monitoring
- Auto-tracking, fail safe mode, Obstruction Detection
- Integrated with CCC and Local CCC

25-05-2019 Sat 18:54:02



PTZ Control of Cameras

08-01-2020 Wed 11:28:11

08-01-2020 Wed 11:28:11

PTZ Controller

PTZ for device: #

PTZ Speed:

08-01-2020 Wed 11:28:11

UAV on Auto Track Mode



Intrusion



Incident Management

Alert/Incident Reporting Process Flow

1. Movements/ Alerts Captured at Edge Equipment



Onsite Setup-
Optical & Thermal
Cameras

1. Movement/ Alerts notified at containerized data center and Monitoring room
2. The notified alerts are analyzed and converted into incidents based on the criticality of the alerts.
3. The incident is reported to concerned Forest officers



Local Modular
Containerized Data
Center &
Monitoring Room

SMS/Email/ Call

1. The concerned forest officer takes actions according to the reported incident.
2. Update the monitoring staff at the container to update the incident based on the action taken.



Field Responders
or Forest
Department's
Officer

1. The alerts/ incidents are stored at central server.
2. Complete case / incident history is helpful to create/ update Standard Operating Procedures.
3. The ML/AI is being used to develop algorithms alert filtering, automated incident reporting, anomaly wildlife movements, critical path optimization etc..

SMS/Email



Centralized
Monitoring and
Administration

Incident Reported

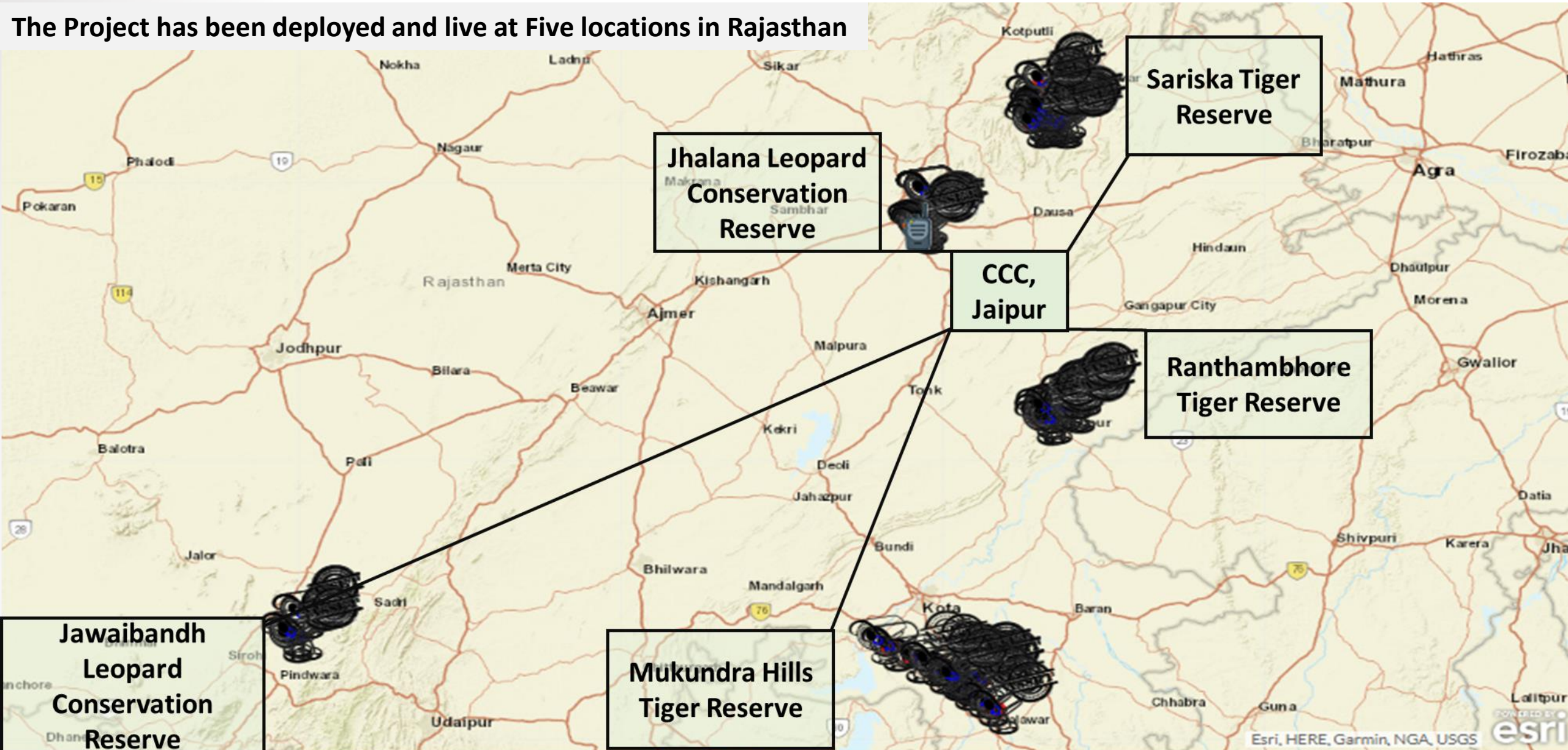
S.No.	Category	JLCR	JNP	MHTR	RTR	STR	Grand Total
1	Fire		2	4	2		8
2	Habitat Destruction					1	1
3	Hunting					1	1
4	Illegal collection of forest produce		1	2	3	8	14
5	Illicit felling of trees			3		17	20
6	Mining		1				1
7	Poaching	1					1
8	Theft				2		2
9	UnauthorizedEntry		95	10	17	103	225
10	Wildlife Activity	3	36	34	277	54	404
11	Other		12	200	46	126	384
	Grand Total	4	147	253	347	310	1061

IT Cell Information Register (Reported Incidents)

क्र.सं.	दिनांक	समय	सूचना	सूचना पर ले गई कार्यवाही	कार्यवाही का	दि.सं.
1.	11-01-2019		वीर खोन्सोविमान से रमपानी वावा की दरगाह के पास पॉल में कुछ लकड़ों के ड्रेज करने की सूचना	दुरत मोड़ों पर पहुँच कर वहाँ जमीन से 50 रजाल सेब का पकड़ा व इसे व्यक्ति कार (होगा)	श्री गौरव राही बन्ना श्री सुब्रह्मण्य - व.र. श्री राजाराम व.र.	FIR No. - 44/8 11-01-2019 से 500 रु का जुर्माना
2.	25-01-2019	10-30 AM	रमपानी वावा की दरगाह के चतुर्पुल पर कुछ लकड़ी लकड़ों के ड्रेज करने की सूचना	मोड़ों पर पहुँच कर मोड़ों से कुछ लकड़ों को पकड़ा व जाते पर नाम	श्री राजाराम श्रीवा का. श्री गौरव	रवना बुक नं - 33/34 से 500 रु का जुर्माना लगाया
3.	28-01-2019	2-50 PM	रमपानी वावा दरगाह पर 5 व्यक्ति शराब पीने व अलगाव में प्रवेश करने की सूचना	मोड़ों पर पहुँच कर वहाँ व्यक्तिओं से पकड़ा व प्रकरण दर्ज कर कार्यवाही की	श्री गौरव राही बन्ना अमरपालना नाका बराक	रवना बुक नं 33/35 से 2500 रु का जुर्माना लगाया
4.	20-02-19	1-15 PM	रमपानी वावा दरगाह के पीछे पहाड़ी पर पलड़ों उलटकी लकड़ों के ड्रेज करे जा रहे हैं। In-100112	मोड़ों पर पहुँच कर लोगों को पकड़ा उनके द्वारा फैलाया गया कचरा इकट्ठा करवाया। प्रकरण दर्ज कर कार्यवाही की	श्री गौरव राही अमरपालना नाका बराक	रवना बुक नं - 33/32 दि 20-2-19 से 2000 रु. जुर्माना लगाया
5.	24-02-19	12-30 PM	वीर वारिजी की कोठी गेट पर से एक लकड़ी का एक लकड़ा लकड़ों के ड्रेज करने की सूचना	मोड़ों पर पहुँच कर लोगों को पकड़ा व प्रकरण दर्ज कर कार्यवाही की गई	श्री गौरव राही राजेशिंह	रवना बुक नं 33/46 दि-24-2-19 500 रु. जुर्माना लगाया
6.	8-3-19	12-40 PM	वीर - वरिष्ठी विरामका मैंगो के पास लकड़ों के ड्रेज करने की सूचना Incidence No. 100127	मोड़ों पर पहुँच कर वहाँ व्यक्ति को पकड़ा व निमागुना कार्यवाही की गई	श्री सुब्रह्मण्य श्री राजेशिंह	रवना बुक नं - 33/48 8-3-19 2000 रु. जुर्माना लगाया

Project Status

The Project has been deployed and live at Five locations in Rajasthan



Impact/ Outcomes

After deployment of the solution number of cases of human intrusion have been decreased.

: **DFO, Sariska**

Deterrence factor has been caused for intrusion cases.

: **CCF, Sariska**

Cases of route violation by the gypsy drivers of safari have been decreased.

: **DFO, Jhalana**

Conservation of Tiger and other wildlife species

Improve monitoring efficiency of Forest Officials

Identification of poaching or other wildlife crime prone areas

Check on infiltration, poaching and illegal mining

Fact based information for Effective Decision making

Command and Control Centre at Aranya Bhawan

Way forward

- Enhance utilization of the solution for other departments such as mining, agriculture, pollution control etc.
- Explore utilization for land use change and wild life habitat & biodiversity Analysis
- Bring other sensors data like Soil moisture Sensor, Air quality sensor, Flood water sensor, Laser Radar etc. on the system for 360° environmental change analysis
- Digital media based publicity initiatives for awareness and tourism
- Rajasthan State is ready to provide support other states for designing and implementation of the solution

Glimpse of Project

Close Edit Fullscreen Map View Clear All Alarms Controls

Alarms: Kalimata_PTZ 2020-01-08 12:45:53 Kalimata_PTZ 2020-01-08 12:45:53 Kalimata_PTZ 2020-01-08 12:45:53 Kalimata_PTZ 2020-01-08 12:45:53 Kalimata_PTZ 2020-01-08 12:45:53



Project Implementation



Project Implementation



Project Implementation



Onsite Setup



Onsite Setup



Local Control Room Setup



Monitoring Room in Container



Data Center Room in Container



Central Command & Control Center



Wildlife is Mother Nature's greatest treasure,
To protect it, we must take every measure.



Thank- You