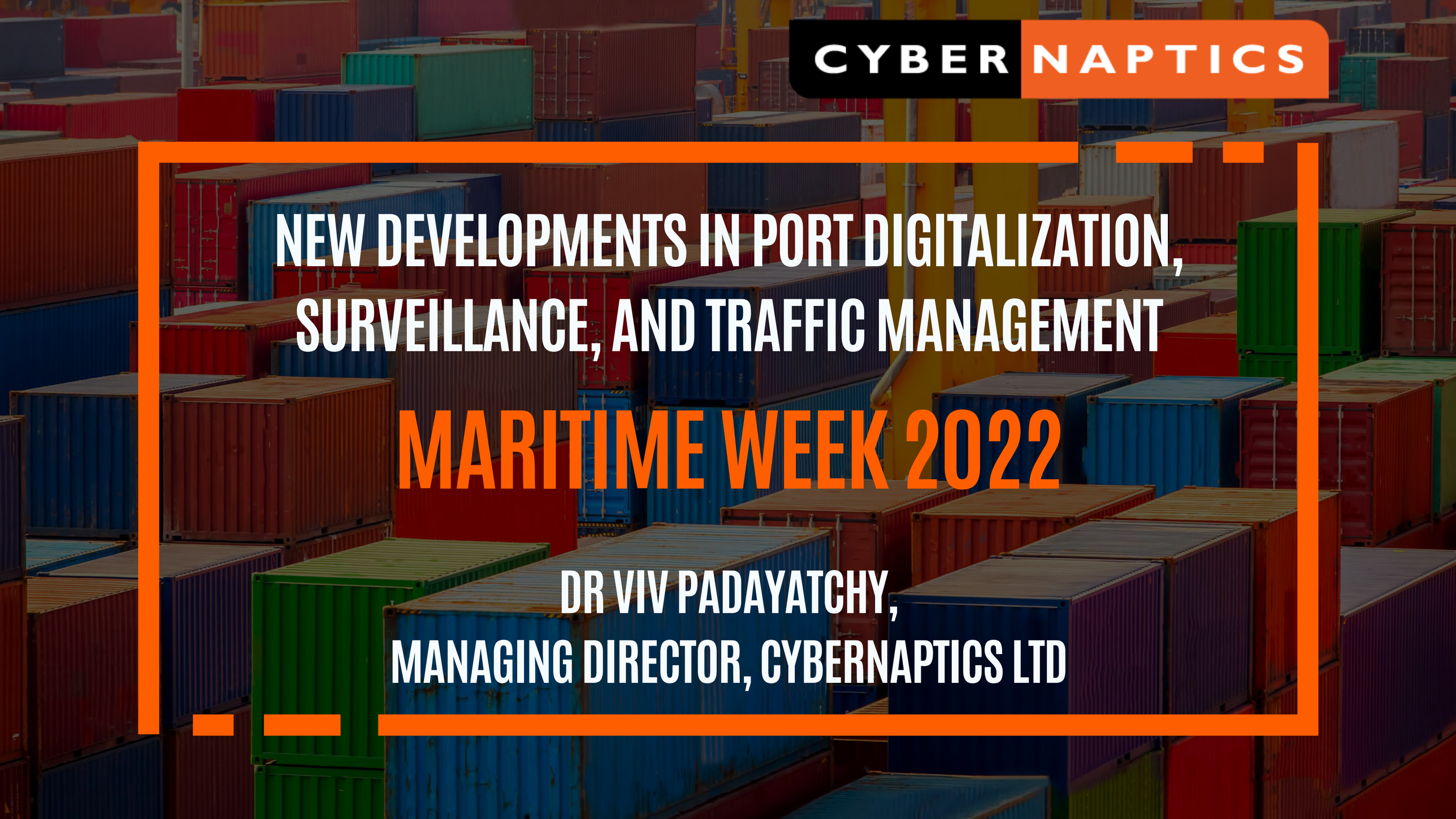


CYBERNAPTICS

NEW DEVELOPMENTS IN PORT DIGITALIZATION, SURVEILLANCE, AND TRAFFIC MANAGEMENT

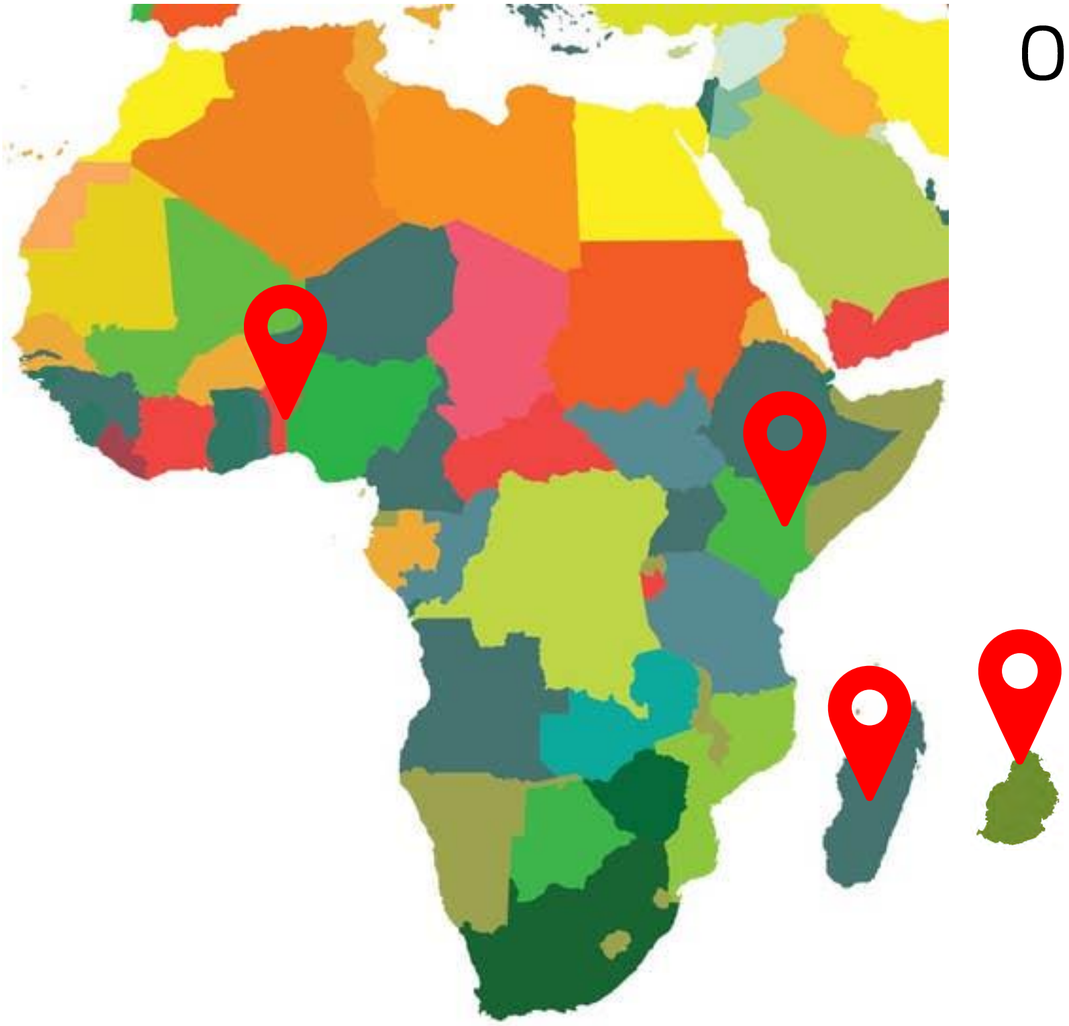
MARITIME WEEK 2022

DR VIV PADAYATCHY,
MANAGING DIRECTOR, CYBERNAPTICS LTD

PIONEERS IN PORT SOLUTIONS SINCE 2009

CYBERNAPTICS LTD

- Support business digital transformation in a completely secure environment
- Specialized in traceability & mobility
- Innovative & tailor-made solutions for the supply chain, logistics, transportation, and manufacturing industries
- Optimization of processes



Our Presence

Indian Ocean:

- Mauritius
- Madagascar

Presence in Africa

- Kenya
- Togo/Benin

PORTS DIGITALIZATION

Gate Control Automation

Wireless Infrastructure

Physical Security

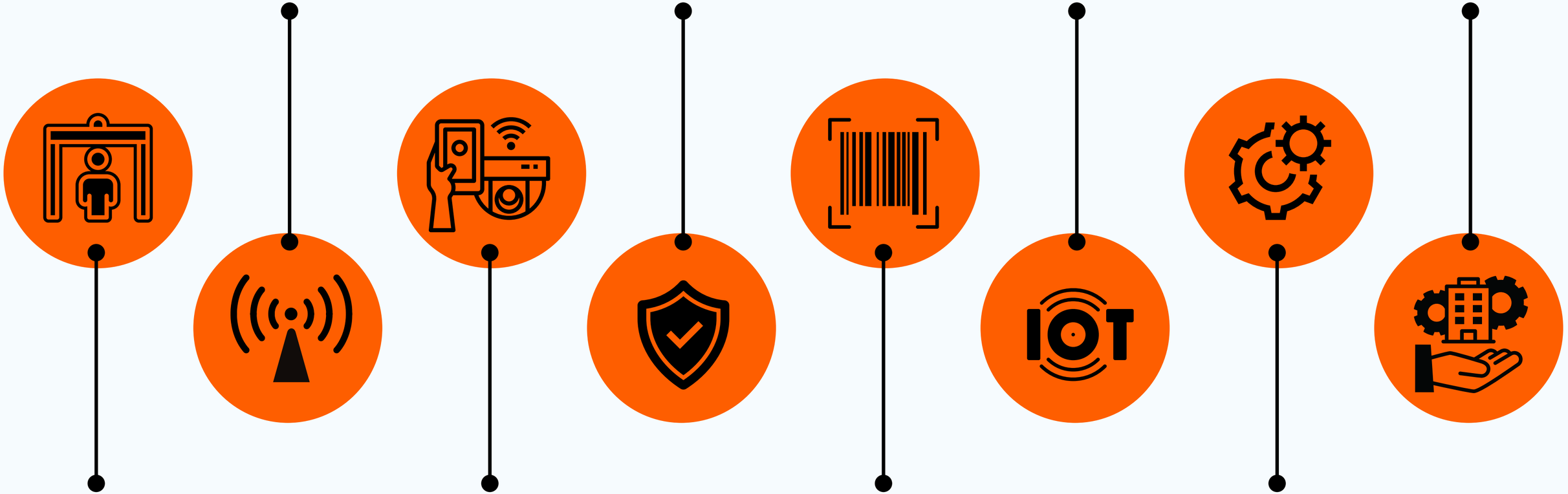
Cyber Security

Mobility & Traceability

Internet of Things

Process Automation

Fixed Asset Management



CONTAINER GATE CONTROL AUTOMATION

HIKVISION

CNR And LPR

Functionality

- ANPR for vehicles passing through gates
- Automated identification of container number, type and door orientation
- Displays full image of left and right sides of containers to assist manual inspections
- Verify, query, and analyze comprehensive container data
- Statistical analysis of gate entry/exit data

Benefits

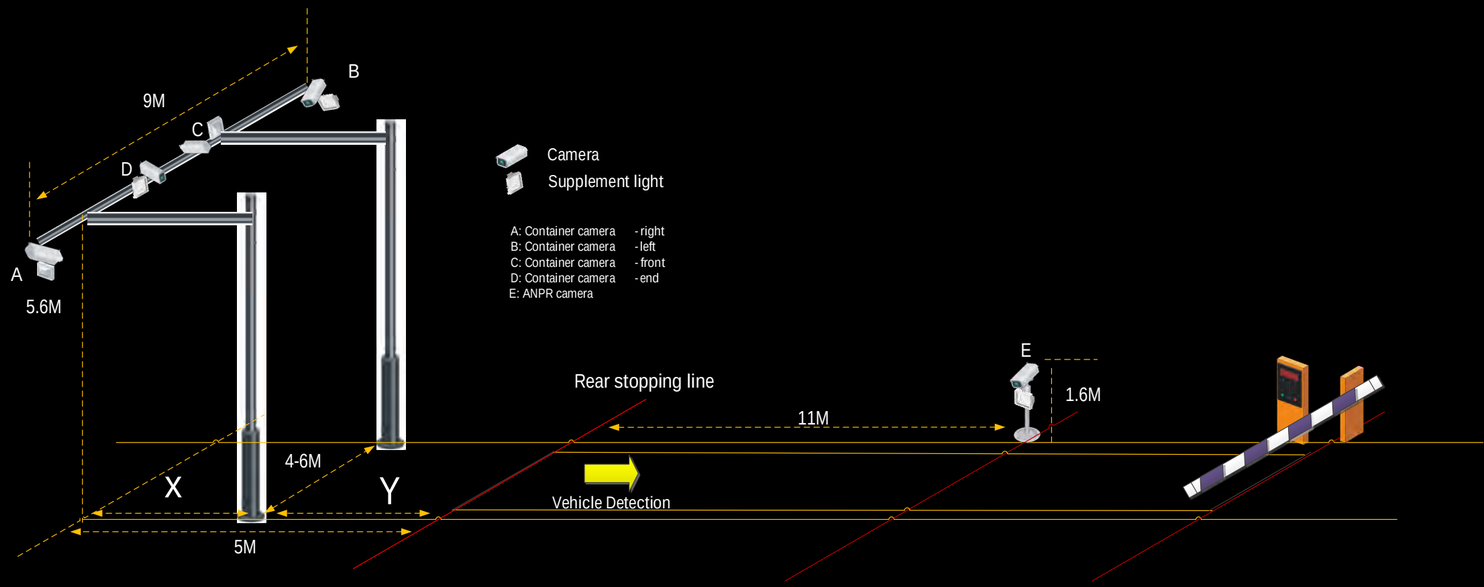
- AI + video detection technology optimizes gate entry & exit efficiency and reduces construction costs
- Container number and license plate number matching, effectively preventing container loss and transportation mistakes, improving security levels at the port
- All egress information and images are stored in the system and can be queried quickly afterwards

Container Number Recognition

- Identification of 20, 40, and 48-foot box, standard boxes, etc.
- Distinguishing single vs. double box
- Automatic identification of container numbers

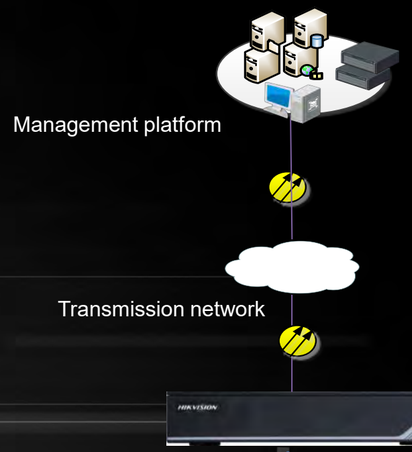
License Plate Recognition

- Identification recording when vehicle speed is less than 30 km/h
- Adapts to a variety of complex environments
- License plate recognition accuracy is ≥ 95%



PORT CLEARANCE GATES

System Functions

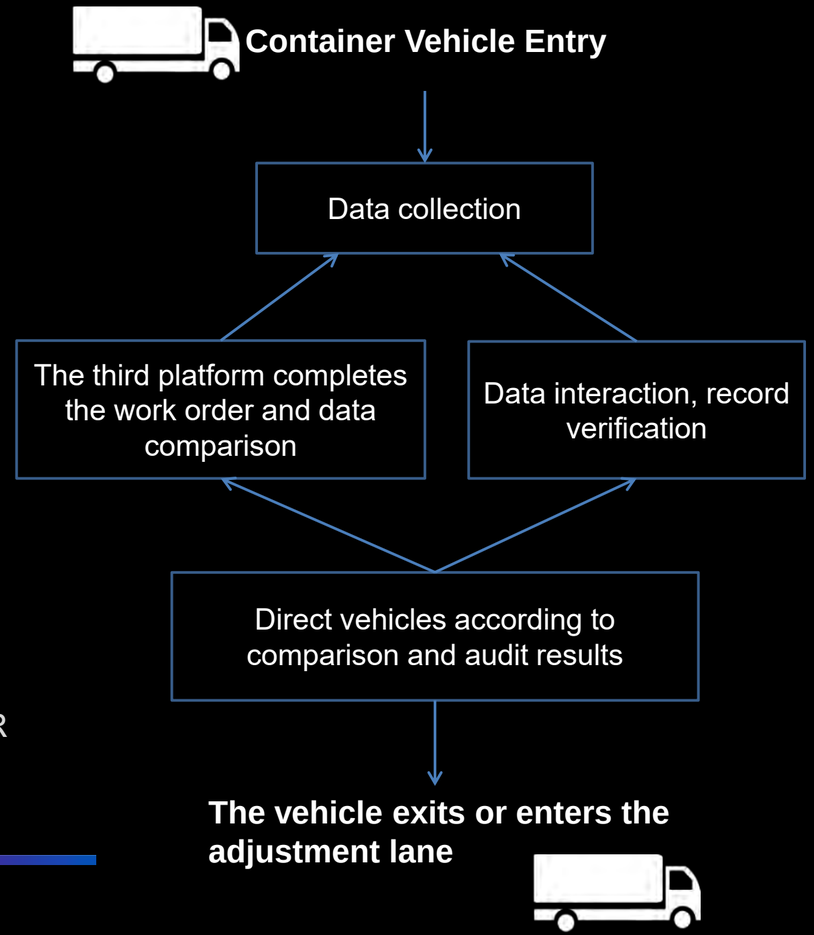


1. Providing data to third-party business platforms
2. Providing the interface for data verification and review
3. Providing query, statistics and analysis interfaces

1. Container number, type, door orientation data generation
2. Matching license plates and container numbers
3. Combining images and related data to form records

1. Providing capture information of CNR and LPR
2. Providing the capture photo of each frame

Business flow



PORT SECURITY

Intelligent Port Operations

Improving clearance gate entry efficiency with AI perception and providing production automation

Clearance gates

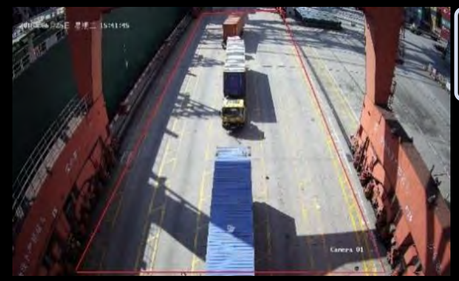
- Auto-number recognition for vehicles plates and containers
- Container and vehicle egress data, statistics, & queries
- Panoramic inspection of containers for damage, etc.

Port Production Safety Supervision

Ensuring the safety of people, cargo, and machinery

Cargo yards and warehouses

- Personnel supervision
- Cargo Safety Supervision
- 360° panoramic oversight



Internal roadways

- Road-threat and speed warnings
- Abnormal driving behavior alerts

Safety supervision center

- AR safety supervision dashboard

Intelligent & Integrated Port Security

Actively perceiving security incidents to ensure the safety of port operations

Office parks

- Vehicle and employee management
- Perimeter & outdoor security

PORT NETWORK INFRASTRUCTURE

ALTAI Super WiFi

Wireless Infrastructure for container terminals

PORT NETWORK INFRASTRUCTURE

ALTAI Super WiFi

Wireless Infrastructure for container terminals

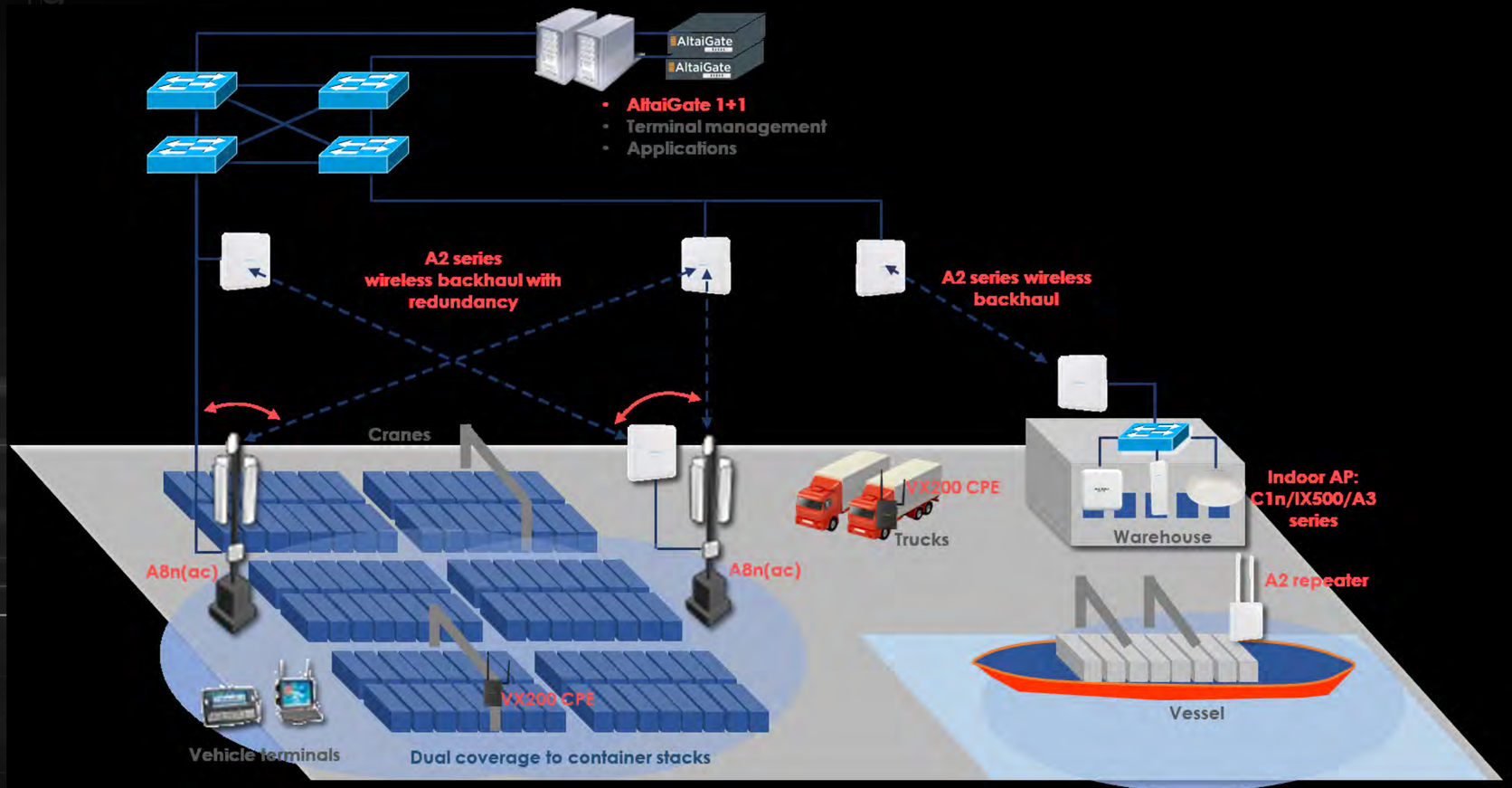
Table 1 Terminal Automation Wireless Network Requirements

Use Case	Overall Requirement	Wireless Network KPI Requirements			
		Latency	Bandwidth	Reliability	RF Coverage
Terminal Operating System (TOS)	Low Bandwidth and High Reliability	< 1 Sec	450 Kbps to 1 Mbps	99.9%	Good Port-wide Coverage
Autonomous and Tele-Remote Operations	Low Latency, High Reliability, Constant PLC Traffic	< 50 mSec	30 Mbps for AutoSC 60 Mbps for RTG	99.999%	Coverage across working area
Autonomous Horizontal Transport (Automation for PLC applications)	Low Bandwidth and Low Latency	< 50 mSec	~ 1 Mbps for AutoSC/AGV	99.999%	Overlapping Coverage across the working area
Off-Machine Live Optical Character Recognition (OCR)	High Bandwidth	< 50 mSec	15 – 20 Mbps	99.999%	100% Coverage

Source: Connected Ports & Terminals, Cisco Networks, Nov 2021

PORT NETWORK INFRASTRUCTURE

Wireless Infrastructure for container ports



ALTAI Super WiFi

WiFi Challenges for Container Ports

- Blockage of WiFi signal by quay and mobile cranes
- Blockage of WiFi signal by stack of containers
- Much interference in the signal environment
- Limited sites for AP installation
- Low transmission data throughput causing a lot of delay
- Unstable WiFi service

The User Expectation

- Long range coverage
- Backhaul resilience
- Double coverage
- Link integrity
- Interference mitigation
- High data transmission throughput and low latency
- Mobile client management
- site monitoring

PORT NETWORK INFRASTRUCTURE

Case Studies

ALTAI
Super WiFi

PORT NETWORK INFRASTRUCTURE

Industrial Switching

PORT NETWORK INFRASTRUCTURE

Case Studies

Turkey - Managing Asyaport with
Altai Super WiFi

Côte d'Ivoire – Container Terminal, Bollore,
Altai Super WiFi Solution

MOBILITY & TRACEABILITY

ZEBRA
PREMIER
BUSINESS PARTNER

1

GATE MANAGEMENT

2

INSPECTION CHECKPOINTS

3

UNLOADING / LOADING CARGO

YARD MANAGEMNT SYSTEM

KEY BENEFITS

- Automatic parking assignments
- Increase space utilization
- Directed task assignment
- Door-to-door moves
- Inbound and outbound scheduling

ZEBRA
PREMIER
BUSINESS PARTNER

INTERNET OF THINGS

Device + Network + Visualization

Water/Fuel Monitoring

- Optimize readings and technical interventions
- Detect leaks in real time
- Manage consumption peaks

Utilities Monitoring

- Inventory control
- Provide business intelligence reporting
- Remove human error

Object Counting

- Meters mapping
- Real-time consumption monitoring
- Notifications
- Data logging

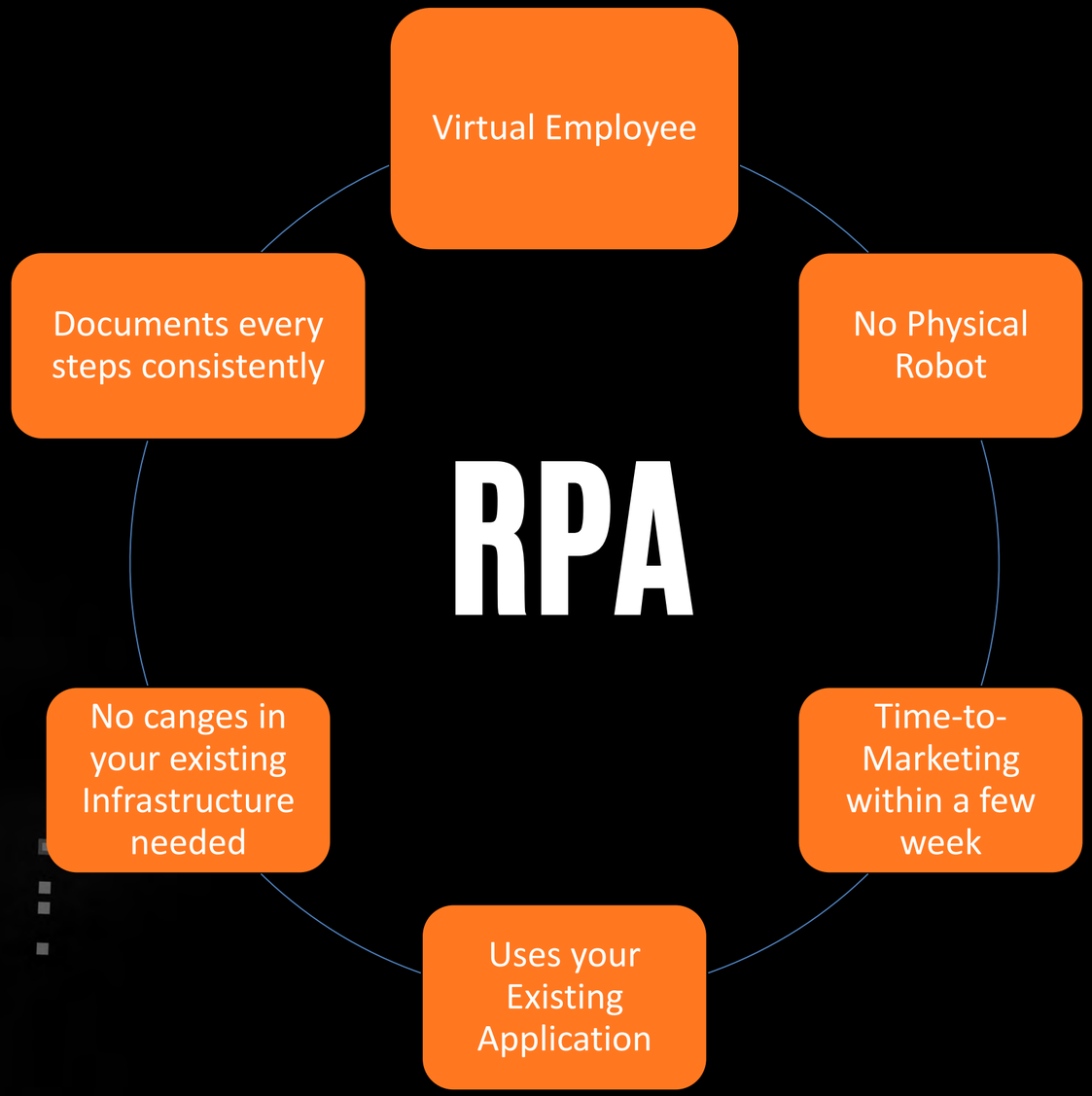
FIXED ASSET MANAGEMENT

Asset Tagging + Asset Tracking + Asset Audit

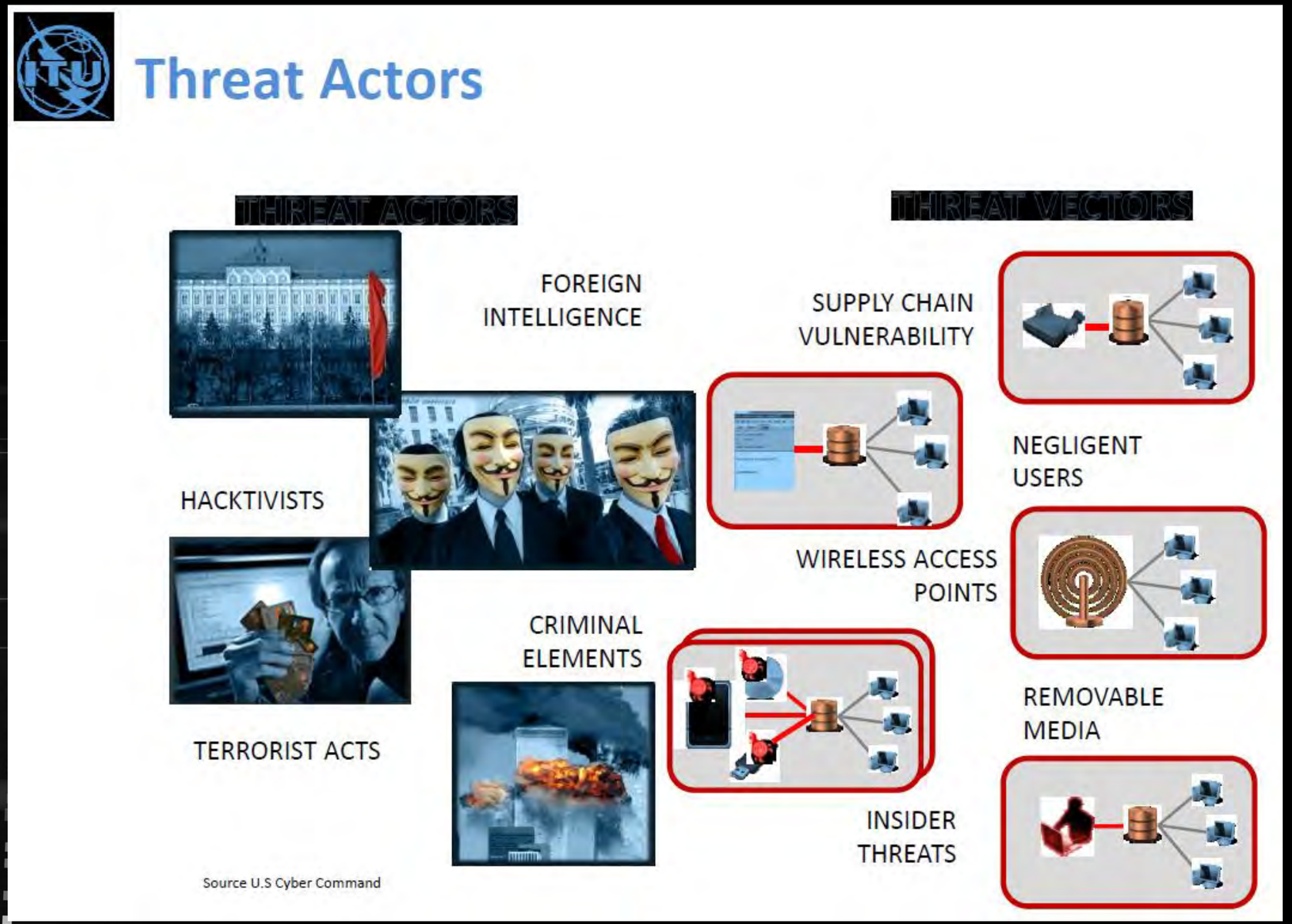
MAIN FEATURES

- Asset Check-in/check out
- Asset Tagging
- Asset Mapping
- Track depreciation and warranty
- Track scheduled maintenance or unexpected repairs
- Asset Audit
- Create and share reports

ROBOTIC PROCESS AUTOMATION



PORTS CYBER SECURITY - THREAT LANDSCAPE



CYBER NAPTICS
THANK YOU
INDIAN OCEAN
MAURITIUS
MADAGASCAR
EAST AFRICA
KENYA
WEST AFRICA
TOGO/BENIN