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Technology Shaping the Future

# Transforming Smart into Genius!

**A holistic approach to Smart City**

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# Local Presence in Romania

- Established in 1993
- Long history in the Telecom sector
- Successfully leveraging experience and expertise to Enterprise and Public sectors
- Main business pillars:
  - **Manufacturing:**
    - Intracom Telecom's Microwave Radio equipment for wireless networks
    - 3rd party terminal products for ADSL/VDSL
  - **Customer Experience Solutions:**
    - Permanent investment in know-how and partnerships with global vendors such as Genesys, Nice, Nuance, RMG Networks…
  - **IT (Integrated & Turn-key solutions):**
    - Delivery services for own software solutions
    - System Integrator for equipment of top IT vendors
    - Highly skilled resources
  - **Infrastructure Deployment, Multivendor Support**

- **4.300 sqm of Production, warehousing & logistics area**
- Production equipment:
  - Surface Mount Technology : 3 production lines,
    - 2 lines with capacity 87.000 components / hr
    - 3rd line modernization in 2015 to increase overall capacity by 20.000 components / hr
  - X-ray Inspection, Wave Soldering, Vapor Phase Machine, et al.
- Employs: ~200 technical and engineering professionals
- Production of :
  - Intracom Telecom's **Microwave Radio** equipment for wireless networks (for whole group)
  - **3rd party terminal** products for ADSL/VDSL (High End)
- Intracom Telecom Microwave Radios **exported to 70 Countries**

- **Ministry of Administration and Interior**: "Implementation of Schengen Information System for Romania (SINS)" – €9.7M
- **Ministry of European Funds**: "Single Management Information System (SMIS)" – €7.6M
- **Ministry of European Funds**, "Portal for lifecycle management of EU structural funds projects (MySMIS)" – € 1.2M
- **Ministry of Agriculture**, "Integrated Information System for Organic Agriculture" - €0,9M
- **Ministry of Administration and Interior**: "Unitary system of planning, schedule, monitoring and reporting events and missions for Romanian Gendarmerie (SURE)" – €1.2M
- **Ministry of Justice**: "Resource Management System for Romanian Judiciary System (RMS)" – 13M€
- **Ministry of Public Finance**: "Integrated System for Financial reporting and expenditure control for all 14,000 governmental and public organizations (FOREXEBUG) – €1M

Network Synchronization, DWDM Transport capacity expansion, ISP Infrastructure, IP-MPLS Backbone, VoIP Networks, CDN, Metro-Ethernet, ADSL Equipment

DWDM and IP-MPLS Low Level Design Subcontractor for the DWDM and IP-MPLS backbones within Wimax Project

Implementation of Satellite Communication Network covering +2000 Agencies

deployment of Country-wide WAN between HQ, Regional offices, fixed and mobile spectrum monitoring stations

Data Interconnection to Bulgaria's Power Grid based on OPGW infrastructure, SDH transmission and IP equipment

Deployment of Wireless Voice&Data connections for more than 300 Business Subscribers

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# Transforming Smart into Genius

# Corner Stone of a Smart City

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A Smart City with an autonomous, secure, ergonomic and low cost “connected” infrastructure to provide targeted services in real time

# Corner Stone of a Smart City

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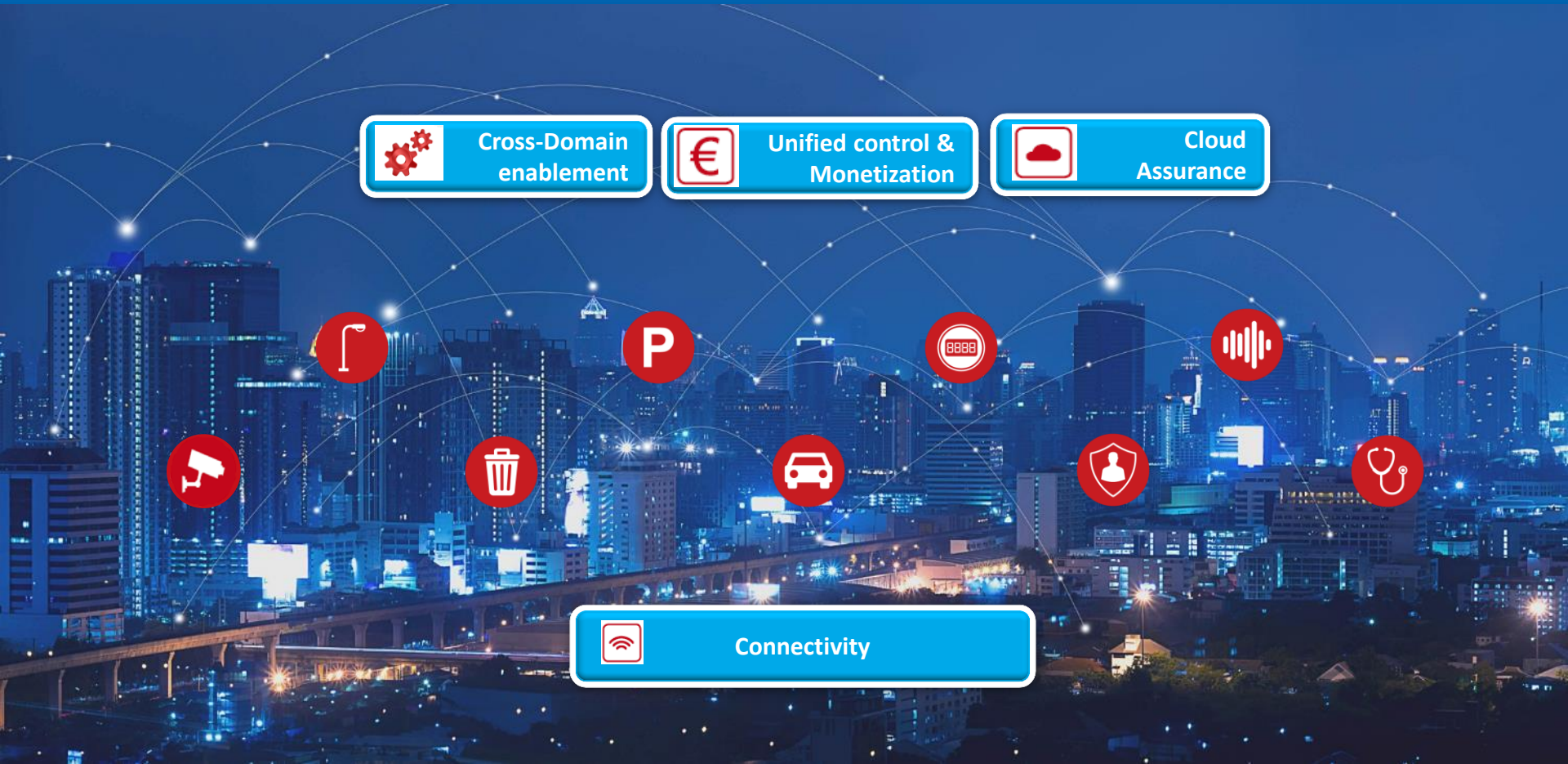

# Smart City offering

Unified Mgt & Control Environment

- Waste Mgt
- Sound and Noise Monitoring
- Smart Parking
- Smart Lighting
- Traffic Monitoring
- Content Push

**Smart apps**

Smart Lighting | Traffic Monitoring | Sound detectors | Smart Parking sensors | Waste Mgt sensors

# Smart Lighting core

Replace legacy lighting with advanced energy efficient LED lights to reduce energy costs, save time and benefit from quality illumination through:

- Intelligent ON/OFF switching (scheduled)- Calender based dimming
- Remote Lighting Management
- Targeted progressive dimming (event driven)
- Efficient management of energy consumption
- Maintenance with preventive grid interventions based on detailed reports.

**Case study in Greek municipality, for 15.000 Street light replacement**

| Energy consumption KWh (before) | Energy consumption KWh (after) | Energy reduction in 10 years on average |
|---|---|---|
| 95.246.423 | 30.465.561 | 68.03 % |

**Energy reduction**

| CO2 emission tones (before) | CO2 emission tones (after) | CO2 emission reduction in 10 years tones | CO2 emission reduction % |
|---|---|---|---|
| 109.496 | 35.005 | 74.491 | 68.03% |

**CO2 emission**

# Smart Lighting extended

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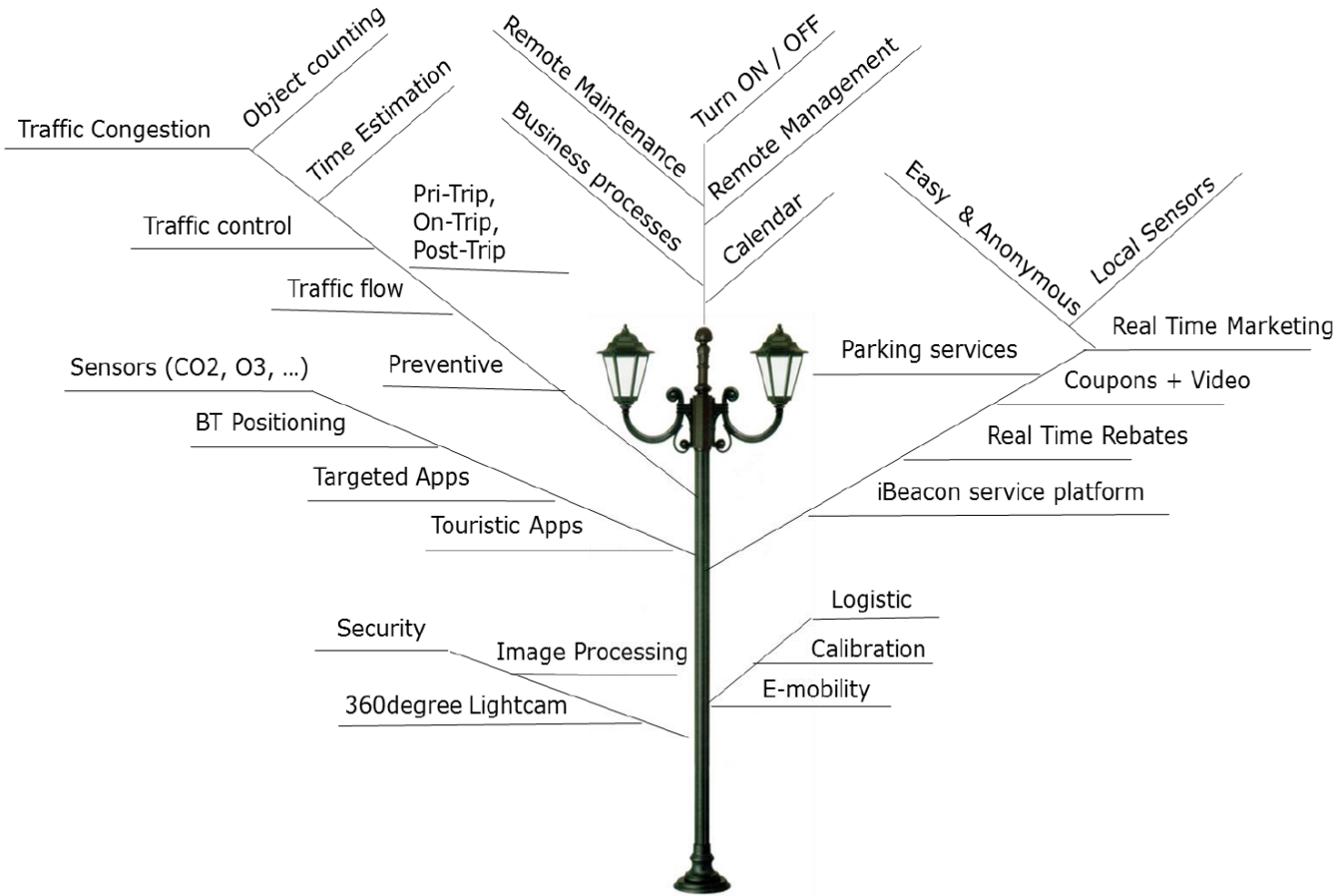
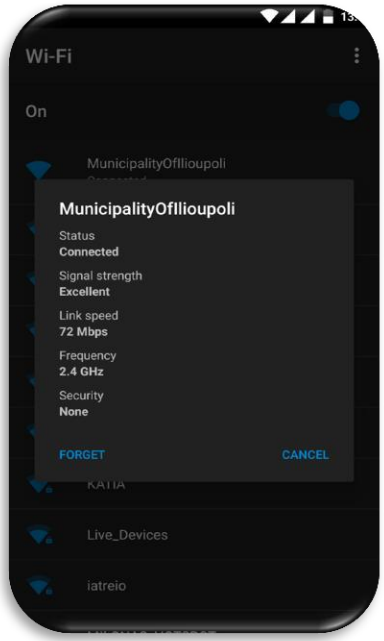


# Wi-Fi Access Point services

In selected places, Wi-Fi AP services can be deployed from the same Lighting controller *




**Municipal Wi-Fi network**

**Internet connection speed test results**

** Appropriate backhaul needed to support such services like StreetNode MW , 3G or Metro Fiber*

# Sound and Noise Monitoring

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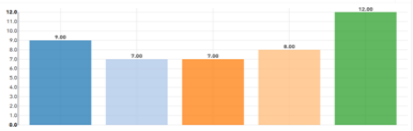
- 24h a day 7 day a week fully autonomous noise monitoring
- Information is provided in real-time
- Alarms triggered :
  - when target noise limits exceeded
  - when special patterns are identified

## Use Case



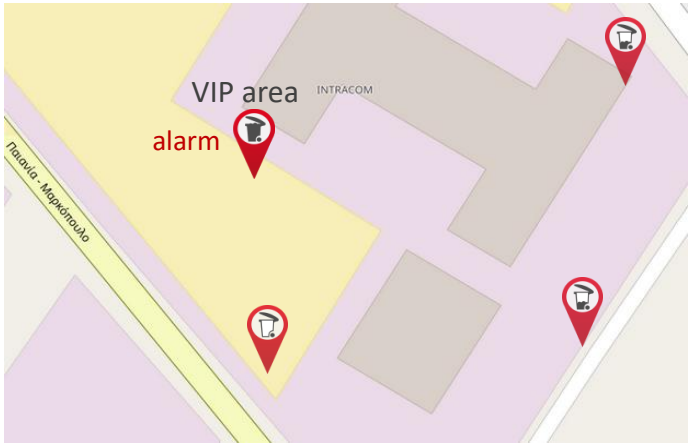
### Noise/Sound Smart app:

- Real Time information on City map
- Dashboards presenting the noise level
- EU defined Noise Levels calculated (KPIs – e.g. $L_{den}$)
- Automatic notifications sent to Authorities when noise limits reached or patterns identified (e.g. traffic accident)

### Actions taken

- Sound to image correlation
- Public Transportation plan improvement to reduce Traffic Noise in City Center
- Security dispatch
- Fast actions & identification of emergency and catastrophic situations

# Waste management solution




Monitor and control

**Waste & Fleet Mgt app:**

An alarm email is sent to the Waste Mgt. team

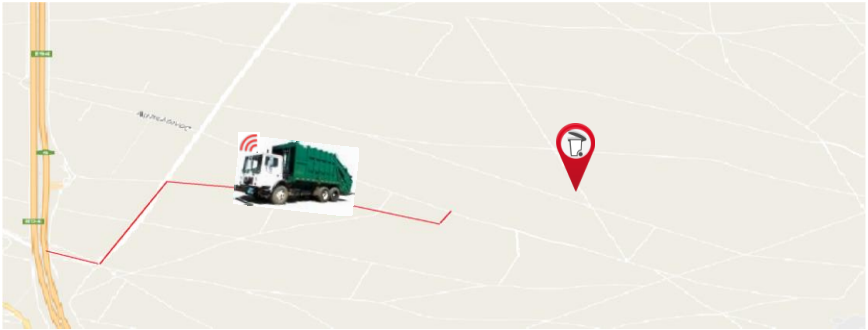
The Waste management “controller” checks the bins and cars location and status

Application suggests optimal route

Waste bin in a VIP area reached the threshold (75%)

Bin Track follows the suggested route and reaches the “alarmed” bin

Alarm seized when bin is emptied



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## Environmental Conditions monitoring and Smart apps:

- Easily installable in current urban infrastructure
- Real Time information on City map
- Measurements of temperature, humidity, radiation, pollution level and other environmental conditions
- Dashboards presenting actual/measured conditions and advanced reports
- Alarms & Notifications
- Emergency situation handling

# Traffic Monitoring Surveillance

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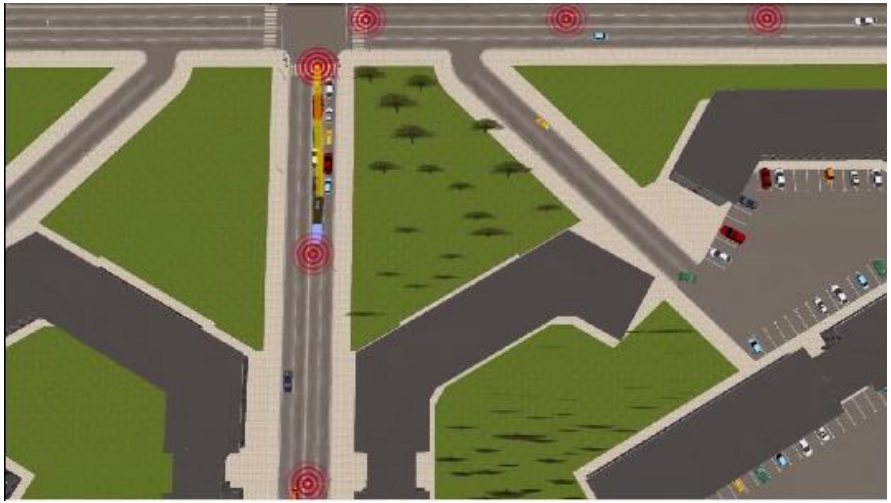
- Anonymous Traffic counting using Ultrasonic technology
- Traffic flow monitoring
- Movement information by Doppler measurements
- People counting using Bluetooth/Wi-Fi technology
- Objects classification and decision making using machine learning techniques
- Advanced security through Surveillance
- Security on fence



# Smart Parking

- Wireless and autonomous Parking sensors
- Real time
  - Detection of the entrance and exit of vehicles
  - Check availability of parking spaces using Smart Parking app.
  - Customized control/view of parking spaces
- Parking violation analysis and notifications
- Customized statistics and reports
- Advanced payment methods support

## Use Case: Monetization example

### Parking Operator is charged for

- Activation fee per parking space/zone
- Advanced Admin app features (e.g. dynamic parking fee change based on demand)
- Fee for patrol officers application (optional for street parking operators)
- Compensate resellers

### Driver is charged a fee for

- Each mobile payment transaction
- Data traffic generated by using Smart App features

### New Revenue Stream

- Online promotion of local shops (to parking)

# Smart City Monetization

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Smart Cities offer unique opportunities for monetization via:

- Direct and Indirect revenues generation (Smart parking, targeted advertising)
- Support of multiple Payment Models (Pre-paid & Post-paid )
- Flexible charging models (e.g. combination of subscription fees with Pay-per-Use charges)
- Dynamic pricing based on Smart service user/consumer behavior (e.g. for Waste Management) or Smart service demand (e.g. last parking space)
- Advanced Partner Management capable to:
  - Compensate resellers
  - Share revenue among partners

NGINius CHARGING for IoT

# Unified IoT Orchestration Platform (uiTOP)

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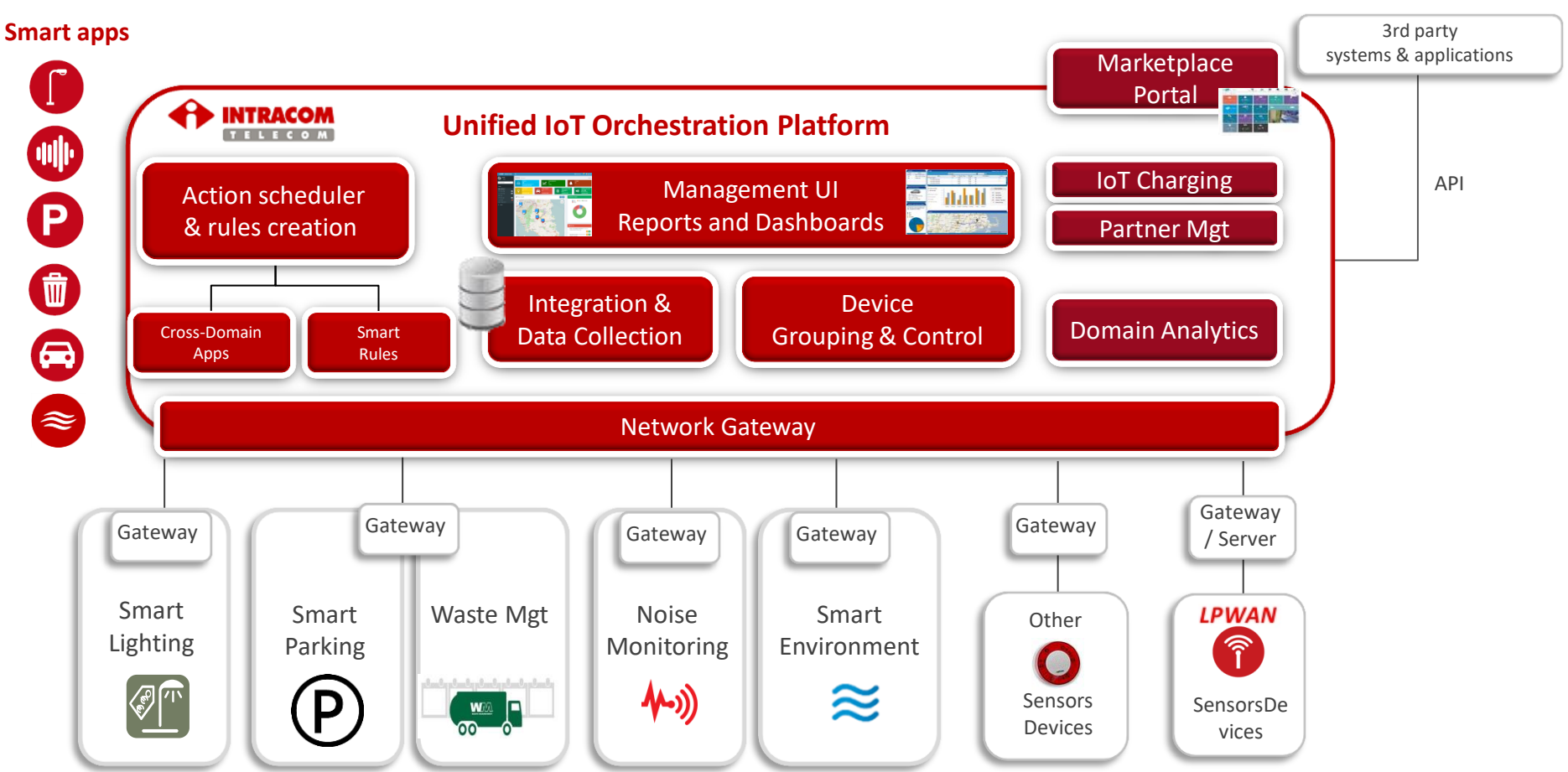

# Unified Smart City view

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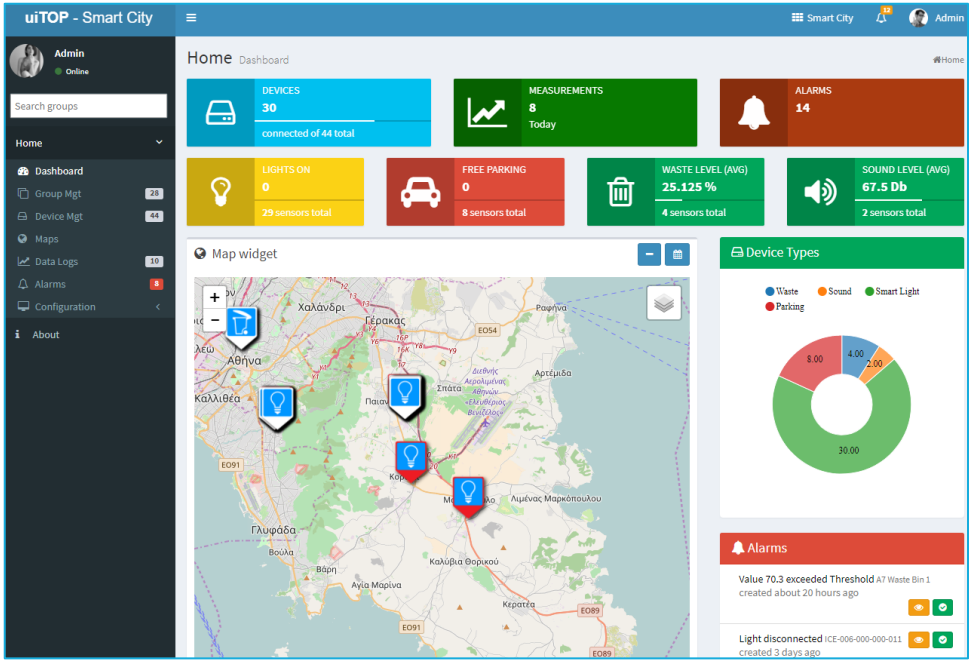
Total Command & Control Environment for Smart City Applications and Services.




Aggregated information in insightful dashboards with powerful Data Analytics capabilities

# Centralized control of Smart City

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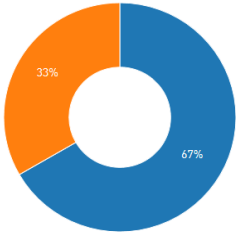
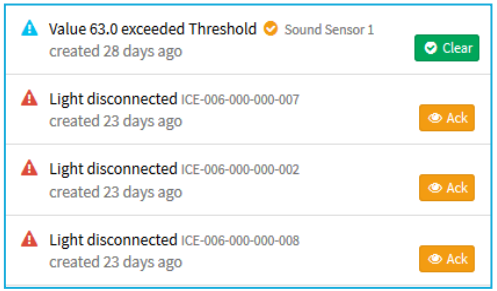
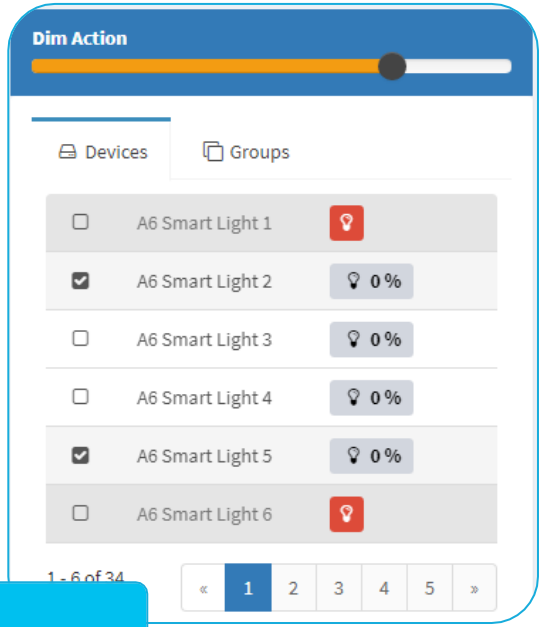
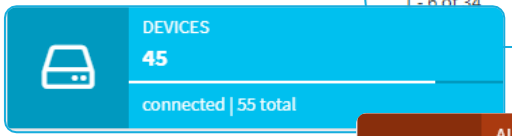
- Custom Dashboards/Pies
- Custom Alarms and notifications
- Custom consolidated Map creation
- Custom widget development for devices control





# References and Pilot projects

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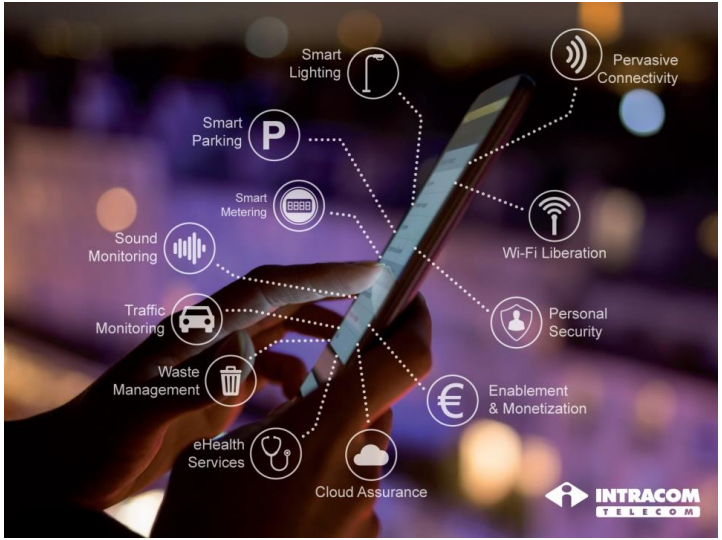
- Deployment of Large scale, e2e, Smart Metering (Meter2Cash) projects in Energy & Utilities
- Pilot SMART CITY projects: Smart Lighting, Smart Parking, Traffic Monitoring, Public Wi-Fi and Beacon services (local municipalities)
- Deployment of IoT/M2M gateway for connectivity monitoring in smart meter project
- Trials related to cross-domain solutions combining Waste Management, Sound monitoring and Smart Parking
- Smart Health services on Intracom cloud - Online Learning and 2nd Opinion, PACS, Telemedicine




Best City awards 2016

# An edge2core approach to IoT

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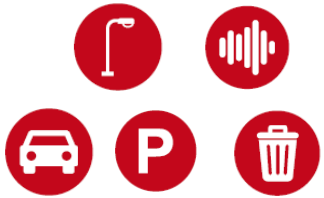
- Horizontal IoT enablement & monetization solutions allowing for market differentiation :

  - IoT Revenue and Partner management
  - Customized Smart City Mgt & Control environment
  - Building and integrating cross-domain solution
  - Customized Dashboards and extensive Reporting
  - Analytics for monetization

- Vertical specific e2e solutions focusing on the Emerging verticals of:
  - Smart City infrastructure
  - Energy & Utilities
  - eHealth/Telemedicine



- Prof. Services: Consultancy, Development, Implementation, Ongoing Support
- Managed services and SaaS hosting

# thank you

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