



GPU accelerated Datacenter for Smart Cities

Transforming Urban Services with AI

Ravi Mishra

Technical Marketing Engineer

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City Challenges

Cities are facing rapid Urbanization, Economic Constraints, and Environmental Sustainability



Rapid Growth Puts Pressure on City Infrastructure, Making it Harder to Maintain Citizen Quality of Life



Greater Need to Manage Carbon Footprint and Improve Sustainability



Boosting Livability Index Is More Crucial Than Ever to Retain and Attract Trade, Commerce, and Talent

**The ability to improve city infrastructure management
is crucial to defining and achieving
social, Environmental, and Economic Success**

Cities have traditionally addressed their operational challenges in silos



Traffic
Management



Public Safety



City Lighting



Pollution/
Environment



Waste
Management



Parking
Optimization

**This Fragmented Approach Is Inefficient, has limited effectiveness,
and is not economical**

By harnessing the power of digitization & AI...



..cities can create a fully connected secure environment



Smart+Connected Communities Solution Architecture



PARTNER APPLICATIONS AND URBAN SERVICES



Transport Management



Water Management



Parking Management



Lighting Management



Waste Management



Environment



Safety and Security



Traffic Management



Monitoring/Command Control Centers

Smart+Connected Digital Platform

Wireless WAN
(3G/4G/5G/ Wimax)



Internet

Secure & Intent based Network

Digital Network Architecture and Multi Sensor Network

STREET



Water



Parking



Street Lighting



Waste



Environment



Safety and Security



Traffic



People



Street Furniture

BUILDINGS



Residential



Industrial



Commercial

VEHICLES



Vehicles

PARTNER SENSORS

Smart+Connected Communities Solutions

6 Smart+Connected Operations Center



1

Smart+Connected
Parking



2

Smart+Connected
Traffic



3

Smart+Connected
Safety and Security



4

Smart+Connected
Urban Mobility



5

Smart+Connected
Lighting

COMMON DATA LAYER: Smart+Connected Digital Platform

SHARED INFRASTRUCTURE: Digital Network Architecture

Enabling additional opportunities for citizen engagement

To Engage, Inform, Protect and Revitalize

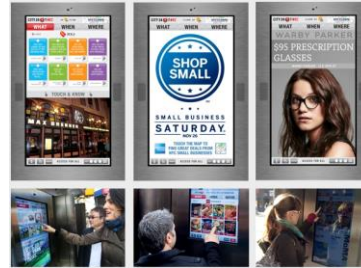
Emergency Notifications



Smart Screens Localized and Personalized



Empowered Small Businesses



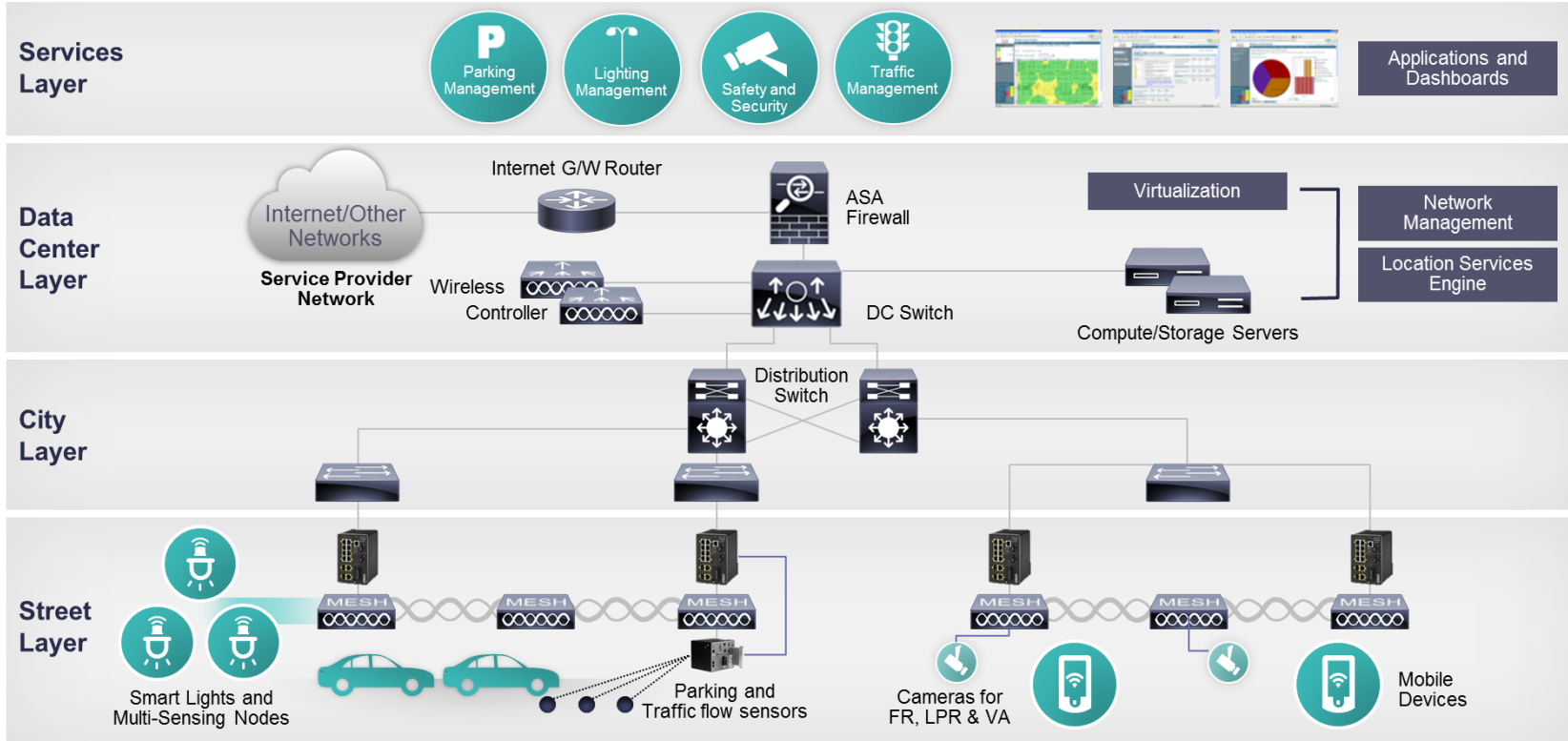
Real-time, Location-Aware Urban Apps



INTERACTIVE PLATFORM:

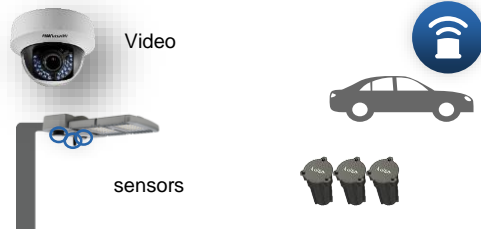
Integrates information from open government programs, local businesses, and citizens

Digital Network Architecture

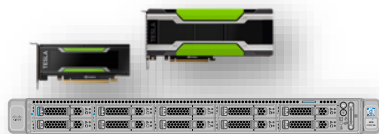


Machine Learning from Edge to DC

Data Source



Cisco video Analytics



Cisco UCS with GPU for Inferencing

Edge



Access Control System



Location Services



ISE



WLC
5508/8500
5520/8540

IOS-XE



Secure and Intent based Network



Cisco Mobility Services Engine



Cisco VSM



Cisco Prime Infrastructure



Cisco UCS with GPU for Training

GPU Accelerated DC

Video Analytics Use case

Transportation ITS World Congress – Oct 2016



INPUT

30 live video feeds
from 3 tram stations,
fully instrumented
tram, 4 cameras at two
ITS demo pods

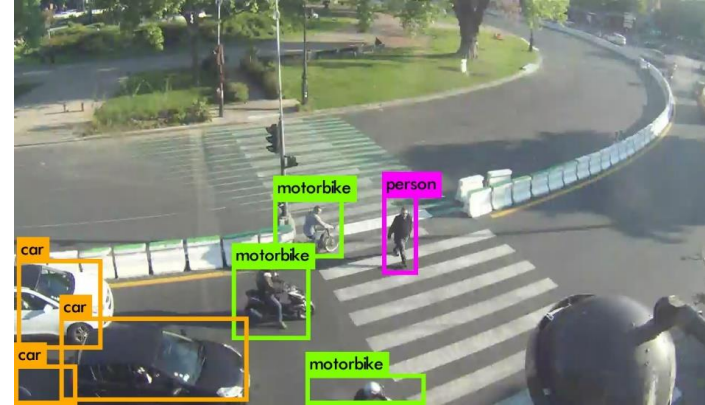
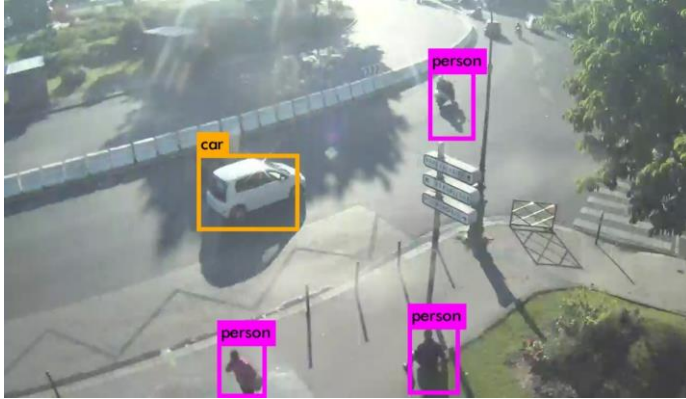


OUTPUT

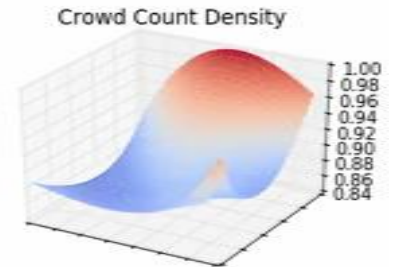
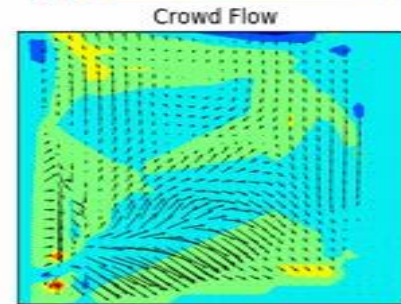
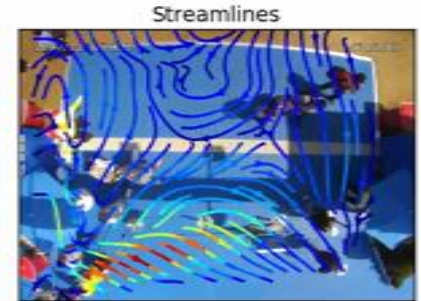
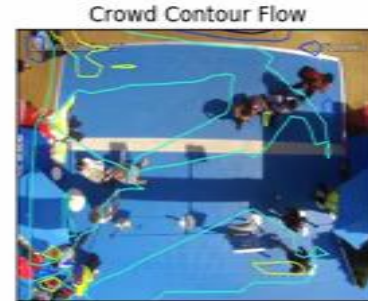
two live analytics
dashboards and real-time
zone analytics via a secure
REST API that powers the
map dashboard

- Analytics tuning: defining zones, adjusting and calibrating cameras, training optimal models
- Mandatory integration with VSM
- Ability to detect and mitigate image artifacts caused by periodic poor LTE conditions
- Automatic recovery (monitor and control client + management agent)
- Demographics dashboard

For smart cities streets



Tracking and crowd analytics: Australia Open 2015



Traffic using Video Analytics



Safety and Security using Video Analytics



Control the
Camera for
investigation

Digital Network
Architecture

Cameras installed in key areas of the City, monitor surroundings for unattended objects, person moving beyond a configured boundary / area. The system can be configured to alert or execute an event when such security violations occur. These alerts / events can then be used to automatically inform appropriate law enforcement systems / agents.

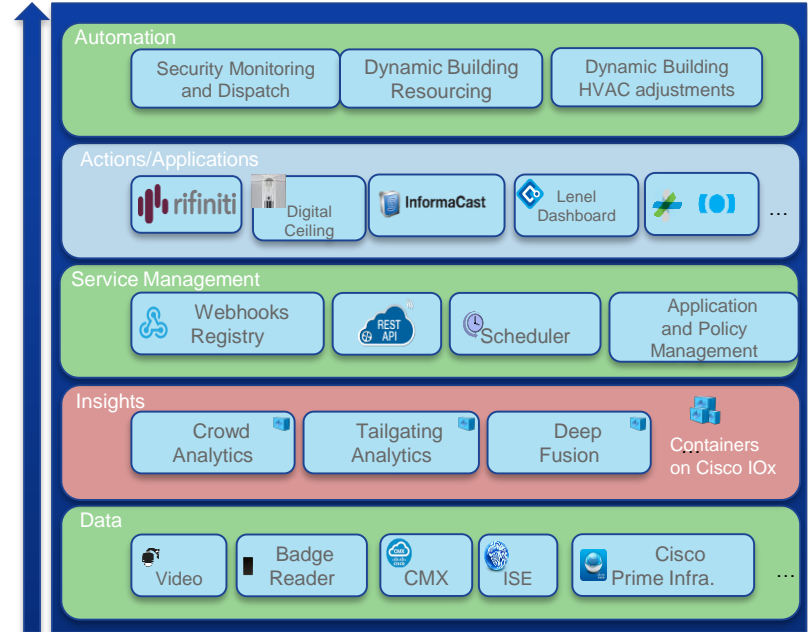
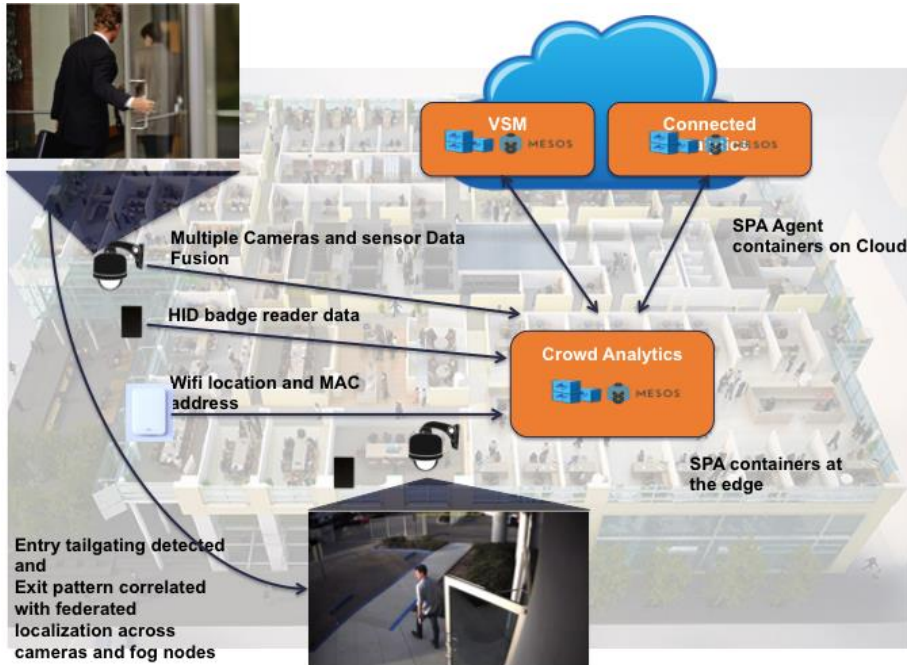


Unattended
object

VA Camera



Safety and Security: Tailgating



The Cyber Valet Service



Cyber Valet Services Project



<https://www.youtube.com/watch?v=z-XL1fyKHeQ>

- Valeo and Cisco announced a cooperation agreement to develop strategic innovations in smart mobility services.
- the driver gets out of the vehicle at the car park entrance and activates the automatic parking system using a smartphone. The vehicle continues its journey in automatic mode until it has finished parking
 - This technology combines the power of automatic parking technologies (Valeo Park4U®Auto), Valeo on-board telematics and secure key systems (Valeo InBlue®)
 - with Cisco Parking Controller technologies, which equip car parks with Wi-Fi, video sensors and AI/DL tracking by detection based solutions

Cyber Valet Services Project



Car via Wifi



IP Cam

Tracking &
Path Matching



Path Generation



Cisco UCS hosting **Dual NVidia P100**

DL, Data Fusion, dynamic path generation, Real time tracking by detection



Cisco GPU Accelerated Datacenter

Accelerated Compute

Artificial Intelligence



Deep Learning
Machine Learning

Accelerated Analytics & Apps



Real-Time and Location Analytics



Unified Computing Systems



Component



Integrated



HyperConverged

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Case Studies

Kansas City, Missouri

“the place to be!”*

Challenge

Deliver a new generation of urban services for city agencies, citizens, and businesses

Create scalable, repeatable, and self-sustainable framework

Bring together certified ecosystem partners

Solution

Create a citywide Wi-Fi network

Provide an open data portal that gathers and shares information across a network of sensors and services, agencies and the public

Install smart lighting and video

Add interactive digital kiosks

Implement smart water initiatives

Results

A set of long-term goals that assimilate collaborators in private sector, real estate, academia, and sports and entertainment.

Application developers harness available digitized city data in new apps that address citywide challenges

A global urban services marketplace is created for buyers, sellers, and citizens

“The Smart+Connected Digital Platform will improve the livability, connectivity, efficiency and economic vitality of Kansas City in ways we cannot yet even imagine, and for generations to come”

Sly James
Mayor, Kansas City, MO

**Named “First of America’s top 5 cities to keep on your radar” by the Huffington Post*

City of Adelaide

Challenge

Stimulate local economy by attracting people to City Center businesses

Lower connectivity costs for mobile government employees

Improve government efficiency by taking advantage of the “Internet of Things”

Solution

Engage iiNet to build Wi-Fi infrastructure based on Cisco wireless solutions

Results

Increased City Center’s appeal by offering free, fast Wi-Fi

Increased efficiency of Council employees who work outdoors

Met time schedule and minimized costs by automating configuration of wireless access points

“Our goal is to make Adelaide a smart, vibrant, and progressive city, a city of the 21st century,”

Raymond Garrard

Chief executive, Department of Further Education, Employment, Science and Technology

City of Barcelona

Smart city initiative cuts water bills, boosts parking revenues, creates jobs and more

Challenge

Improve citizens' quality of life and stimulate a new Smart City economy.

Solution

Citywide sensors capture vital information for smart water, smart lighting, and smart energy management projects

Results

\$58 million annual savings using smart water technology

\$50 million annual increase in parking-fee revenues due to use of smart parking technology

47,000 new jobs created

“We are not really putting our focus on a concrete area, but taking little steps forward and thinking about how technology can be used to transform the lives of our citizens...[and] the companies that are part of the city...”

Julia Lopez
Coordinator of Smart City Strategy, City of Barcelona

City of Hamburg / Hamburg Port Authority

IoT Capabilities improve Citizen Experience and Management of Waterways, Rail, and Roads



Challenge

Develop a strategy to modernize, maintain, and constantly improve the City and the infrastructure of the Hamburg Port Authority (HPA)

Solution

Identification of several Smart+Connected City solutions including City Wi-Fi

Extensive system integration for waterway, train, and road traffic management

Results

Sensors enable city and HPA to make smarter decisions: people receive data at the right time so they can invoke the proper processes when needed

Integrated traffic management system waterways, roads, rail allows port to manage bridge closures and roadway congestion that tends to increase when ships are offloading

“The reality is this: The reason we would look for a holistic model is that we have all this business going through the city, but it impacts the citizens. To create a model where we are able to do this without negatively impacting the citizens and the city itself is our goal.”

Dr. Sebastian Saxe

Chief Information Officer, Hamburg Port Authority



CISCO

TOMORROW starts here.