Steve Hellin
Business Development Executive, Mobile

The Connected Life: 25 Billion Connections by 2020

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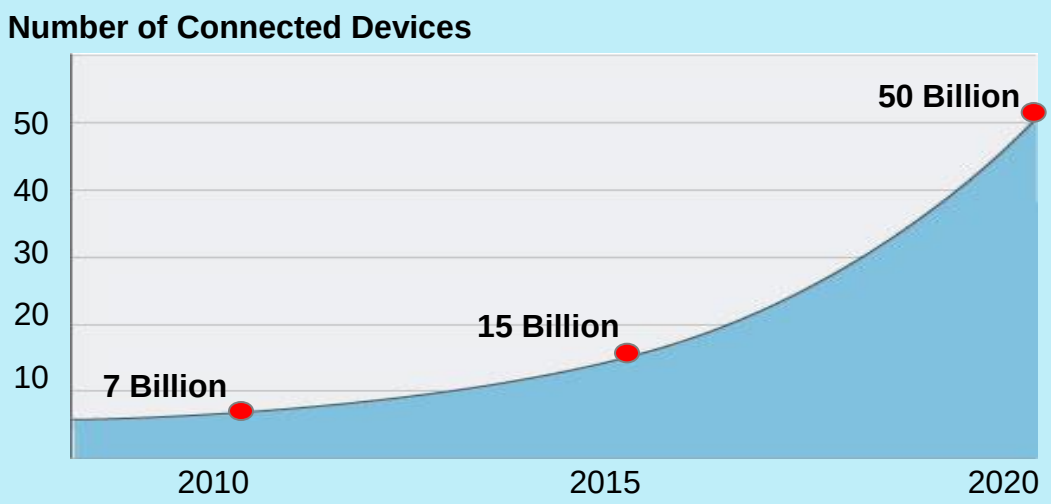
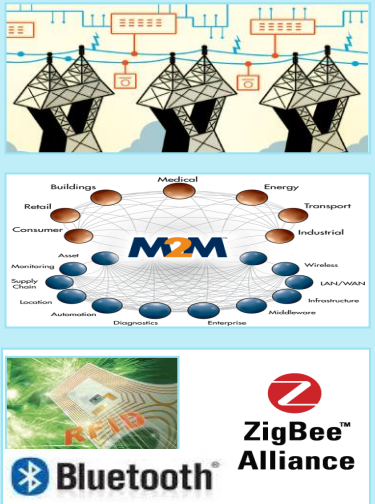
IoT Offers Huge Growth Opportunities in Infrastructures and Services





Multiple Sources: Intel, Ericsson, Gartner, etc.

End-to-end IoT infrastructure is needed to operate and manage 50B connected devices by 2020

Source: Company data, IDC, Yankee, Gartner, in Macquarie Group, March 2009

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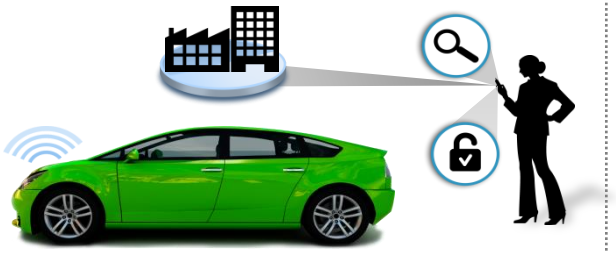
Sample Use Cases for Mobile and M2M



Connected Vehicle

- Find my car
- Predictive parts failure
- Vibration detected, garage notified
- Unlock my car

Connected Home

- TV notifies of incoming calls
- Millions of homes subscribe and publish events to head office (HQ)
- HQ sends targeted advertising back

Connected City

- Collision detected, emergency services notified
- Surrounding vehicles notified
- Traffic lights controlled

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Expanding our mobile portfolio with new capabilities

125+ patents for wireless inventions in 2012, bringing the total to 270

1H 2012

IBM acquired:
IBM Worklight

Named leader in interactive design

IBM acquired:
Emptoris Rivermine Telecom Expense Management

IBM announced:
IBM Endpoint Manager for mobile devices

1H 2013

IBM acquired:
Urban Code DevOps Platform

Worklight named 'Best Mobile Development Solution'

IBM announced:
IBM MessageSight

IBM announced:
IBM MobileFirst

IBM announced:
IBM mobile cloud services

IBM acquired:
Tealeaf CX Mobile

IBM announced:
Managed Mobility and MAPM Services

IBM announced:
IBM Security Access Manager for Cloud and Mobile

IBM announced:
IBM Connections Mobile

2H 2012

IBM MessageSight appliance for MobileFirst & M2M

- **Simplifies "Internet of things", connected car, and mobile**
- Designed for millions things, millions of events
  - Very dense, very green technology
- **m2m engineered for wireless**, with low latency, reliable delivery and quality of service
- **93x faster, 10x less battery, 8x lower bandwidth** versus HTTPS
- 1 rack does 273M messages/sec, 21M concurrent connections (like 1,000 web servers)

Source: http://stephendnicholas.com/archives/1217

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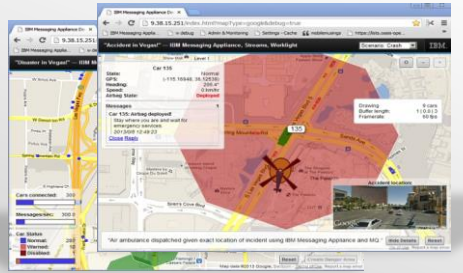
IBM MessageSight for mobile and m2m

millions of connections
million of events
very dense, very green
1 rack = 1,000 web servers

93x faster messaging on mobile
11.89x less battery to send
170.9x less battery to receive
8x less wireless overhead
50µs app-to-app on fast network

WebSocket & MQTT

MQTT



HTML5 WebSocket

IBM MessageSight

InfoSphere Streams

pub / sub

Content

Insurers

OEM Apps

MQ

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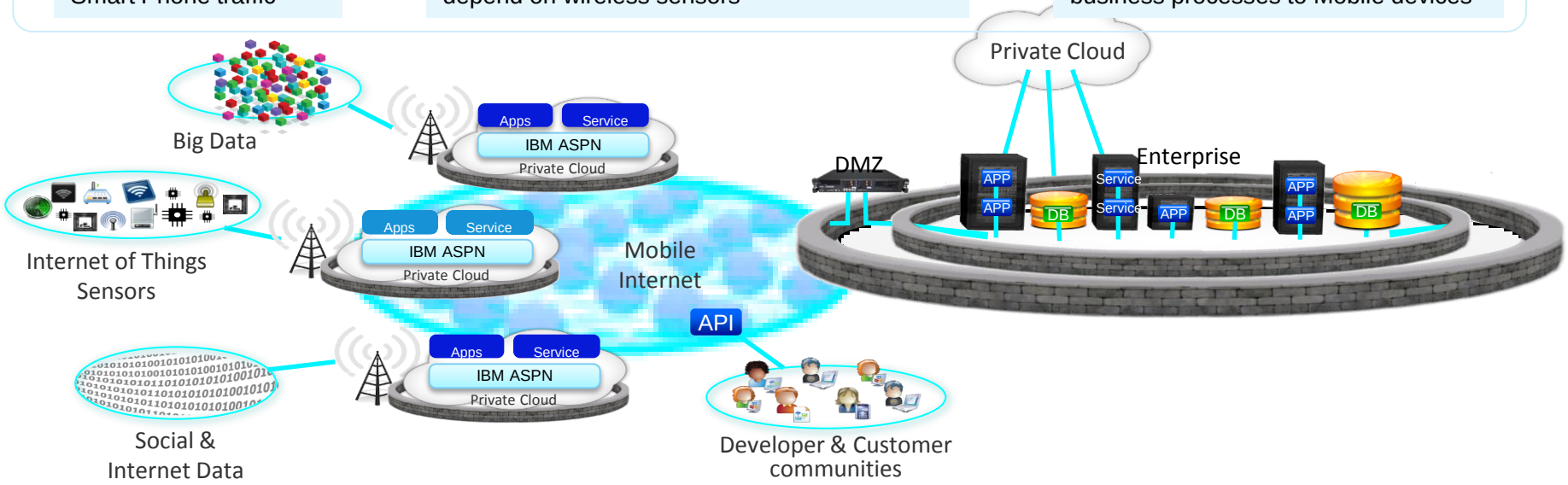
MobileFirst includes IBM Application Service Platform for Networks - scaling M2M applications at the edge of the mobile network

Mobile Networks are at the heart of Business Innovation and Transformation

Continued growth in Smart Phone traffic

Mission critical Vertical solutions increasingly depend on wireless sensors

Enterprises are rapidly extending their business processes to Mobile devices



ASPN Benefits

Improve quality of experience
Innovative software eco system

Optimise network traffic
Deliver low latency

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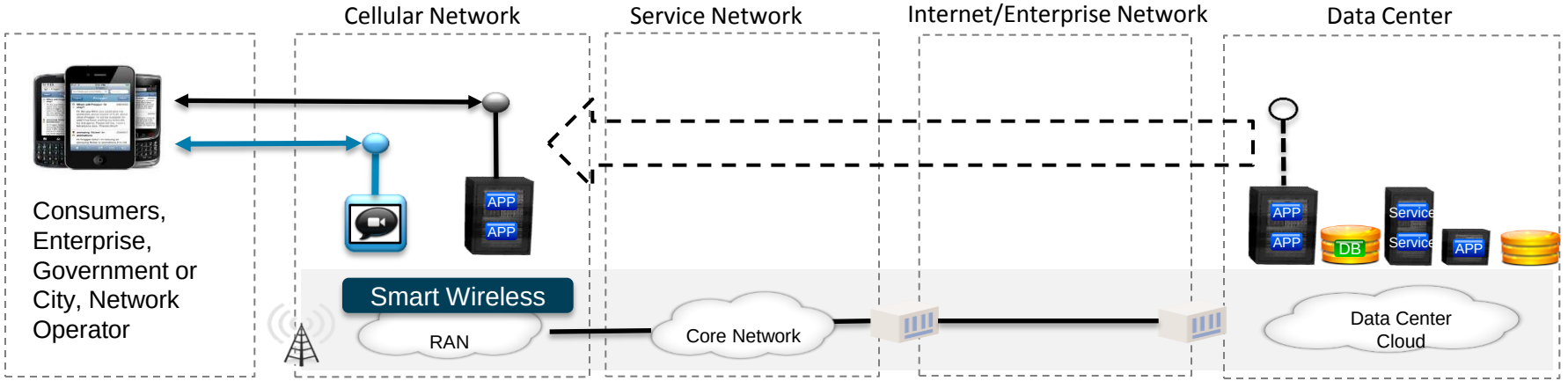
Benefits of running applications at the network edge



The edge environment has ***capabilities*** that can be exploited?

Low latency	Backhaul avoidance	Core network offload	Device CPU offload	Radio & location information
• Low RTT brings a responsive & immersive consumer experience and enables new M2M scenarios.	• Processing and caching at the edge can reduce uplink and downlink traffic flow.	• Processing at the edge can reduce load on core network, especially for M2M cases	• Offloading processing from the device to enables advanced immersive and assistive solutions with reduced device CPU requirements and lower battery drain.	• Edge radio information and location has better fidelity than at the core. More accurate, higher sample frequency, lower latency of delivery.

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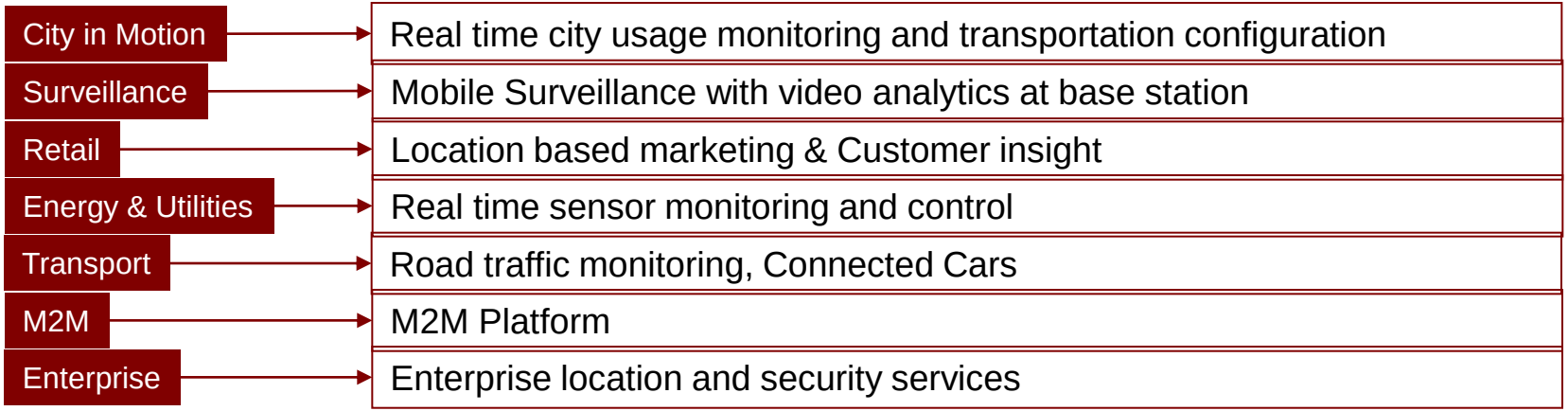
IBM industry solutions and strategic partners can bring compelling offerings to the network edge quickly

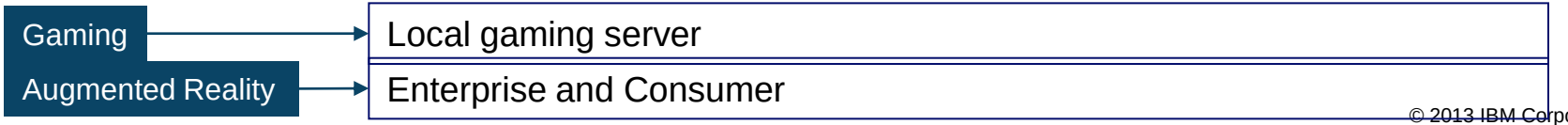
IBM Industry Solutions

Sample IBM solutions extended to run at network edge



IBM Partner Solutions

Sample Consumer services IBM could develop with strategic partners



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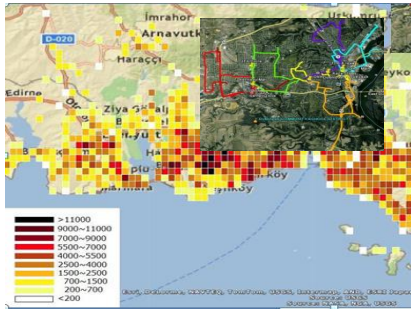
IBM City in Motion

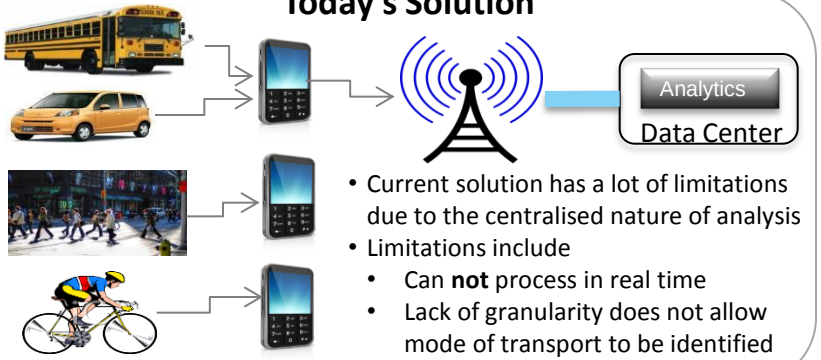
IBM Offering



Mobile phone movements reveal how and where people go

- **real-time management** (traffic information, signal control, bus dispatching, etc.)
- **short-term planning** (event planning, road closures, time-of-day adjustments, etc.)
- **long-term planning** (zoning decisions, construction scheduling, etc.)

Today's Solution



- Current solution has a lot of limitations due to the centralised nature of analysis
- Limitations include
  - Can **not** process in real time
  - Lack of granularity does not allow mode of transport to be identified

Network Edge Based Solution

- Location analytics deployed directly at cell tower
- Distributing processing and gaining access to richer data

Benefit to Mobile Operator

- Network Edge based solution can deliver ***unique*** real time and mode of transport features
- Operator cell tower footprint provides distributed infrastructure
- Sticky, long term annuity contract with city

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Enabling the optimisation of City transport systems in real time

Smart City

Traffic Lights
Public Transport
Road Signs
Police

City rearranges transport system in real time

City Transportation Control System

Benefit to the city

- **Real time system wide visibility of commuters using city transit network**
- **Real time insights into transit operations performance**
- **Proactive management of public transport and better informed commuters**

Operator provides real time crowd movement

City provides real time transit information

Real time Analytics

IBM InfoSphere Streams

Radio data

NSN Radio Access Cloud Server

Real time movement

Integrate to City

Control

Aggregate

Operator Cloud

Real time city information

Operator Revenue Opportunities

City Sell end to end solution for real time transport management to city

App Smart phone app overlaying real time city performance on map

API Sell real time city movement and city info to 3rd parties

City Movement Sensors

Intelligent Transport Solution

Processing location at the network edge enables real time analysis and control throughout the system

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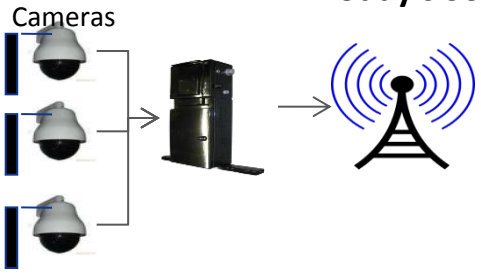
IBM Smart Vision Suite

IBM Offering

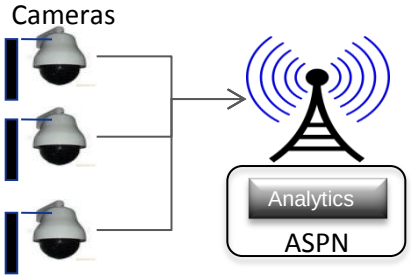
- Light Portable Observation Device
- Wireless Infrastructure
- Analytics Observational Device
- Image Analytics

Today's Solution



- Analytics deployed at the Core requires high bandwidth always on connection

Network Edge Based Solution



- LPOD Analytics functions deployed to network edge as software
- Meta Data describing objects is sent to network core avoiding need to carry raw video

Benefit to Mobile Operator

- Mobile surveillance offering can be offered as a service
- Network backhaul optimised by carrying analysed video meta data

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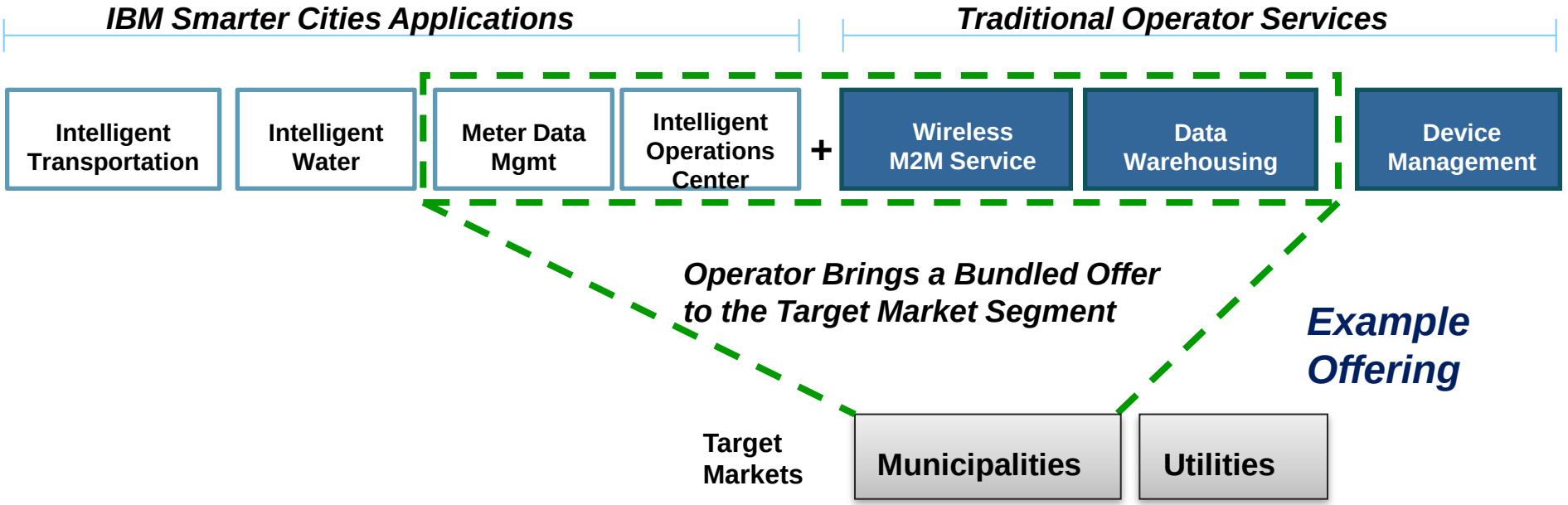
Operators can compliment existing offerings with high value IBM Smart offerings



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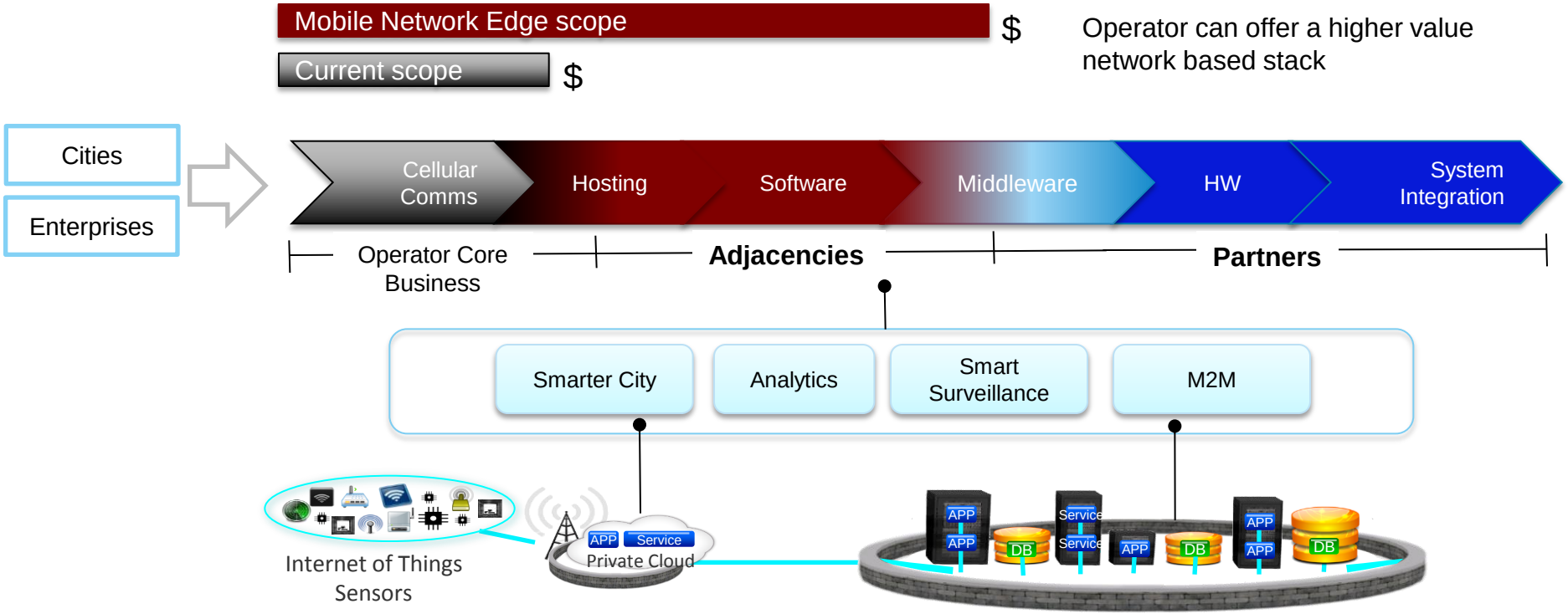
…and benefit from adjacent ***Sticky*** opportunities in the network



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