Silver Spring Networks

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Silver Spring Networks is the largest platform provider of critical infrastructure, transforming energy grids, cities, and hundreds of millions of lives

Our Proven IoT Networks Around the World

23.6 MILLION ACTIVE IoT DEVICES

COVERING ~60M PEOPLE

600M DAILY RECORDS, OR 220B PER YR

ACROSS 1.5M SQ. MILES ON 5 CONTINENTS

>99% UPTIME

4B DAILY BYTES

Key Themes Driving Utility Transformation

Utilities are poised to capture value from emerging opportunities

Platforms facilitate low marginal cost to add devices, apps and new services

Ability to deliver city services more efficiently and in a coordinated way

Ability to leverage a single network for multiple applications

More citizen engagement and empowerment is key to loyalty and satisfaction

Experience delivering real/physical world services is a big advantage

Opportunity for cities and utilities to partner in deploying "Internet-of-Things"

PLATFORM AND SCALE

Building the Foundation for Connected Cities
An open platform connecting a vast ecosystem of applications & devices

Silver Spring®
NETWORKS

Leverage Your Network Investment
Boost smart grid ROI with SilverLink Water AMI

SILVERLINK
IPv6 Network Platform • Control and Security • Data Platform • Analytics

SMART ENERGY	SMART WATER	SMART CITY
Billing & Customer Care	Billing & Customer Care	Street Lights
Grid Management	Leak Detection	Smart Parking
Energy Efficiency	Water Quality	Digital Signage

BUSINESS TRANSFORMATION

How SilverLink gets you there

- Power core smart grid use cases with significant network capacity to spare
- Accelerate time-to-value with an integrated suite of analytics solutions
- Partner with a trusted advisor that can develop a custom business case to address your priorities and operational challenges
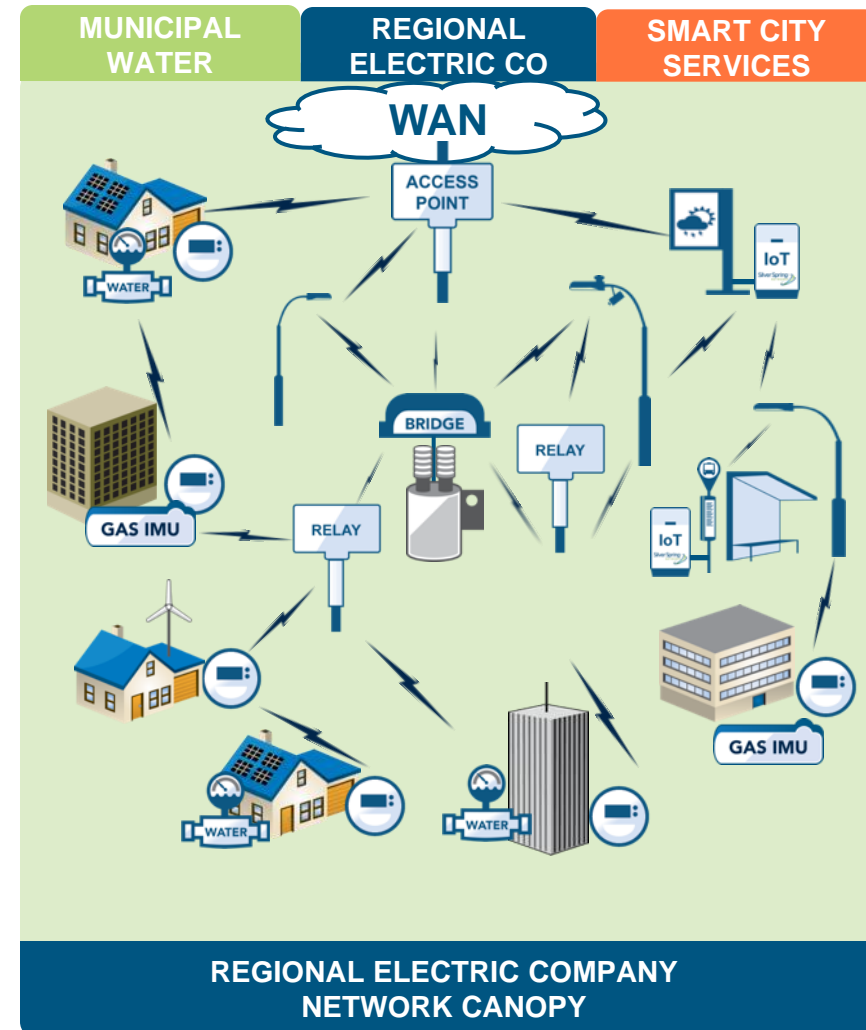
The Utility Transformed

How SilverLink drives efficiency and unlocks new revenue

Monetize your network

- Serve multiple tenant utilities using a shared back-office infrastructure
- Segment your network and use excess capacity to power applications for tenants

Embrace a new service model

- Leverage your core assets and capabilities to power joint meter reading for water utilities
- Serve new types of customers such as municipalities, university campuses and corporate facilities

MUNICIPAL WATER | REGIONAL ELECTRIC CO | SMART CITY SERVICES

REGIONAL ELECTRIC COMPANY NETWORK CANOPY

Introduction to Starfish

WHAT IS IT?

It's For Everyone!

Public / quasi-public entities:
city departments, utilities, public lighting operators, highway and transportation administrations

Commercial enterprises: infrastructure services companies, large campuses and port authorities, businesses, and device makers

Developers: makers, developers serving their customers

Benefits

Unlocking benefit for boroughs

Accelerating Innovation for your citizens

Delivering new revenue streams from 3rd party usage

Spurring economic development for London

- Broad Cloud Platform and Application Ecosystem
- Data Platform
- Network Control & Management
- Physical Network
- Broad Sensor and Device Ecosystem

★ S T A R F I S H ™

STARFISH

| Global IoT Network Service	Open Standards/ Developer Program	Tiered Network Services Offering
• Starfish™ IoT network coverage provided by Silver Spring • Initial service in North America, Europe, Asia and India • Subsequent additions beginning in 2016	• Utilizes IEEE 802.15.4g Wi-SUN interoperability standard • Supports continuously powered and battery powered devices • Open APIs, Developer Programs	• Service ranges from free "Haiku" messaging to full range of advanced SLAs • World class Coverage, Bandwidth, Security, Reliability and Scalability

Self-Configuring & Self Optimizing

Starfish Mesh
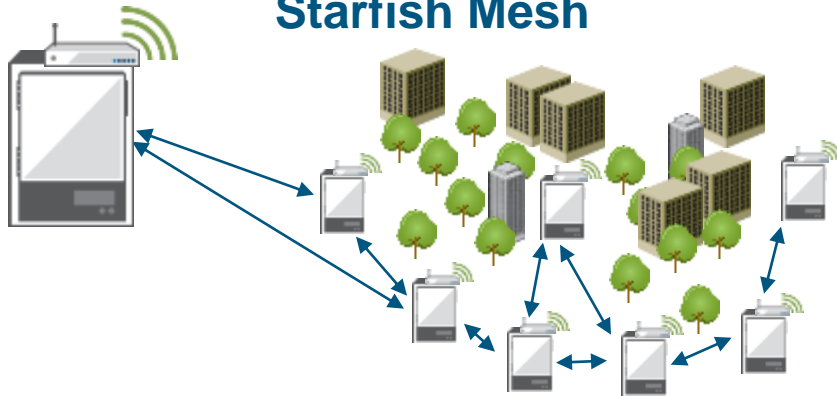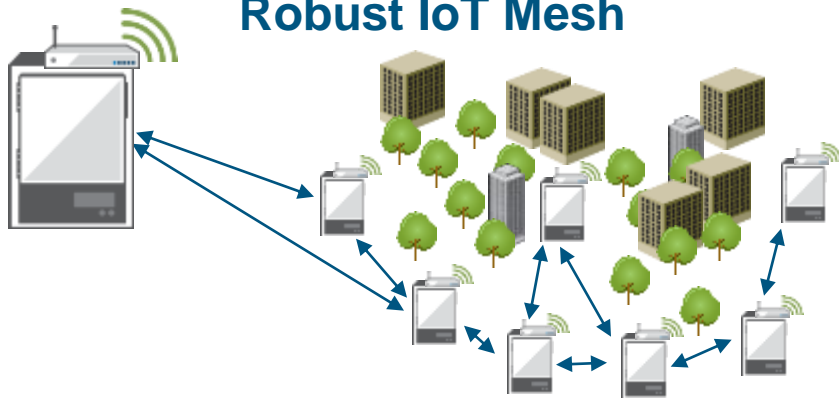
Alternative System
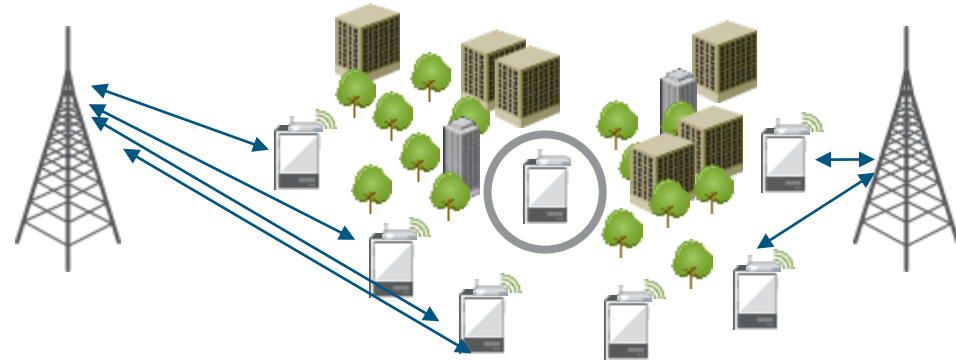
- **Mesh Coverage**: Starfish RF Mesh extends coverage around obstacles: the most difficult problem in a radio network

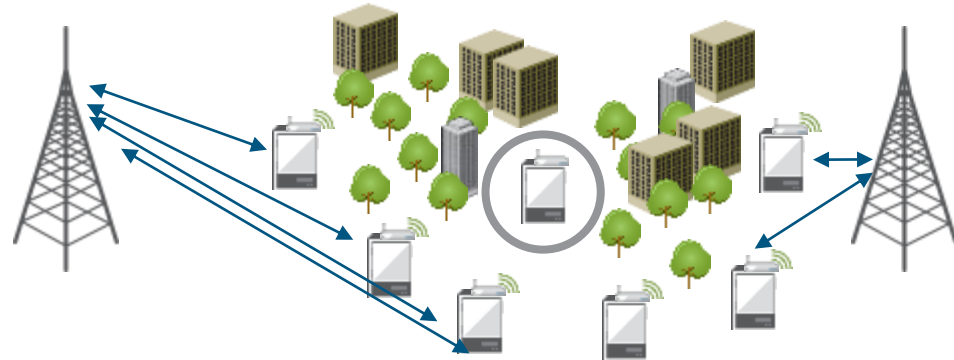- **Designed for Failover:** Endpoints register with multiple takeout points

Not All Networks Are Created Equal

Robust IoT Mesh

Alternative / Consumer Systems

Robust IoT Mesh	Alternative / Consumer Systems
• Standards-based IPv6 + carrier technologies / 802.15.4g	• Quasi-Standard 'alliances' controlled by single vendor
• Up to 2.4 Mbps speeds	• Speeds < 100 kbps
• Low latency < 10 milliseconds	• Latency of 15 mins, if not higher
• 23M+ devices deployed	• Few 1,000's deployed
• 20+ years battery life	• 3-5 year battery life
• End to end encryption; PKI	• Security by obscurity
• Proven 99.9%+ reliability	• No proven SLAs or reliability
• Pennies per month in cost	• Pennies to dollars per month in cost

robert w.
galvincenter
for electricity innovation
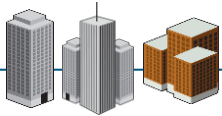ILLINOIS INSTITUTE OF TECHNOLOGY

◆IEEE

What can Starfish do for you?

Businesses

- Uptime, reliability and security that you demand
- Compelling business value & SLA
- No sensor or cloud lock-in

Cities

- One network to support multiple smart city applications
- Compelling business value & SLA
- Silver Spring's track record of innovations across mature deployments

Makers/ developers

- Network performance for your applications
- Compelling business value & SLA
- Accelerated access to large addressable market

Utilities

- Leverage smart utility network investments
- Compelling business value as additional revenue opportunity and/or opex reduction
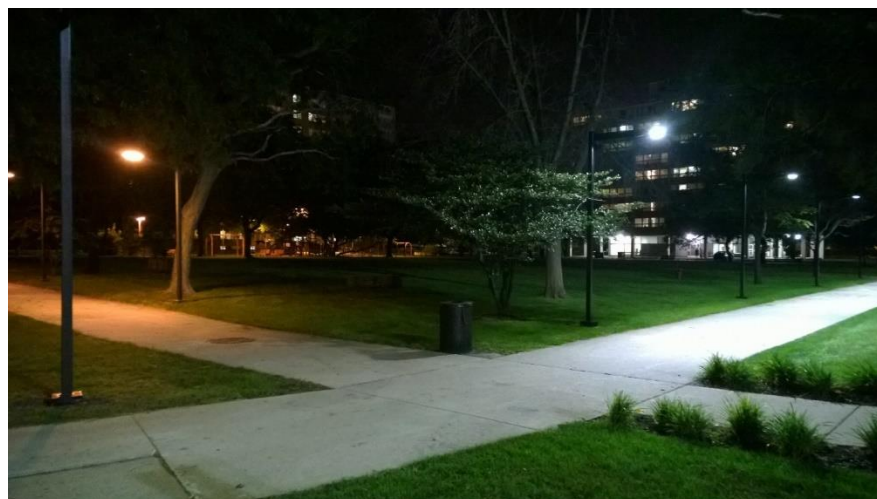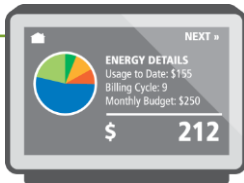
STARFISH @ csmart
Center for Smart-Grid Applications, Research & Technology

- Building out campus wide canopy network leverage campus lights to create a mesh network
- Will provide ubiquitous coverage throughout the campus to support multiple applications on campus

Initiatives on the Horizon

A diverse set of projects are in the works for Fall 2016

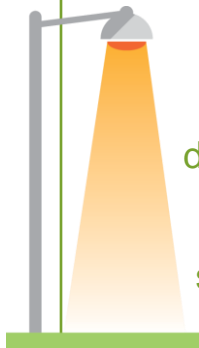**Smart Home / Building**: Demonstrate load disaggregation in the home or high-rise building

EV Charging & Solar Generation : Monitor application impact on the grid and correlate to environment for predictive energy production/consumption

Other Initiatives as applicable:
- Integration with City of Chicago Data Portal
- Waste management
- Parking / Image analytics

Smart Streetlights: Enable smart city by deploying SSN Network using streetlights. Develop and test new streetlight applications
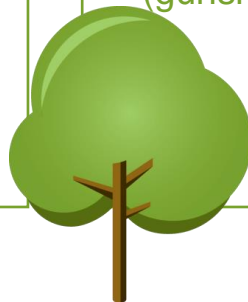
City Sensors: Install environmental sensors (water, solar, etc.) and urban sensors (gunshot detection, urban noise)

Water & Gas AMI: Measure real impacts of water AMI on campus, demonstrate new application of SSN technology

Smart City Customer Successes

- 2,000+ controlled LED luminaires
- Collaboration with Bristol is Open, Bristol City Council, and Bristol University

- 20,000 controlled LED luminaires
- Save 65% of energy use
- Integrate traffic and lighting systems

- 16.000 cabinets and 180k lights in Paris
- Save 30% of energy

- 500.000+ lights in Florida
- Largest streetlight network in the world

500 CITIES IN 16 COUNTRIES

Solutions Breadth On One Network Platform

From metering to street lights – the everything network can do it all

ADVANCED METERING	SMART CITY INFRASTRUCTURE	DISTRIBUTION AUTOMATION	DEMAND SIDE MANAGEMENT	CUSTOMER ENGAGEMENT	INSIGHTS & ANALYTICS
AMI OPERATIONS	**SMART CITIES**	**GRID RELIABILITY**	**DEMAND RESPONSE**	**CUSTOMER ENGAGEMENT**	**ACTIONABLE INSIGHTS**
ELECTRICITY	STREET LIGHTS	FLISR	DIRECT LOAD CONTROL	CUSTOMERIQ	SILVERLINK INSIGHTS SERVICE
GAS	TRAFFIC CONTROL	VOLTAGE OPTIMIZATION	PRICE RESPONSE	MARKETING SERVICES	REVENUE ASSURANCE
WATER	SECURITY & CAMERAS	NETWORK MONITORING	ENERGY EFFICIENCY	CUSTOMER PROGRAMS	
PREPAY	ENVIRONMENT SENSORS	PV & RENEWABLE INTEGRATION			