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Beyond Today's Applications

#SmartFuture2015

Glenn Ricart
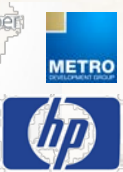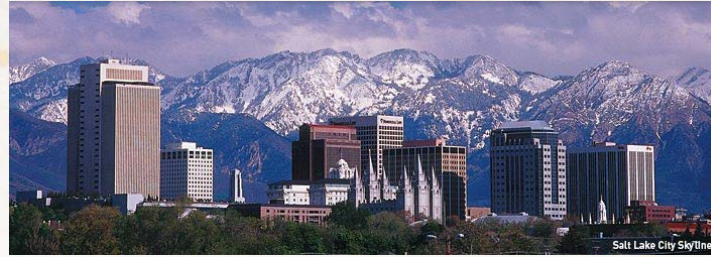
March 25, 2015

geni
Exploring Networks
of the Future
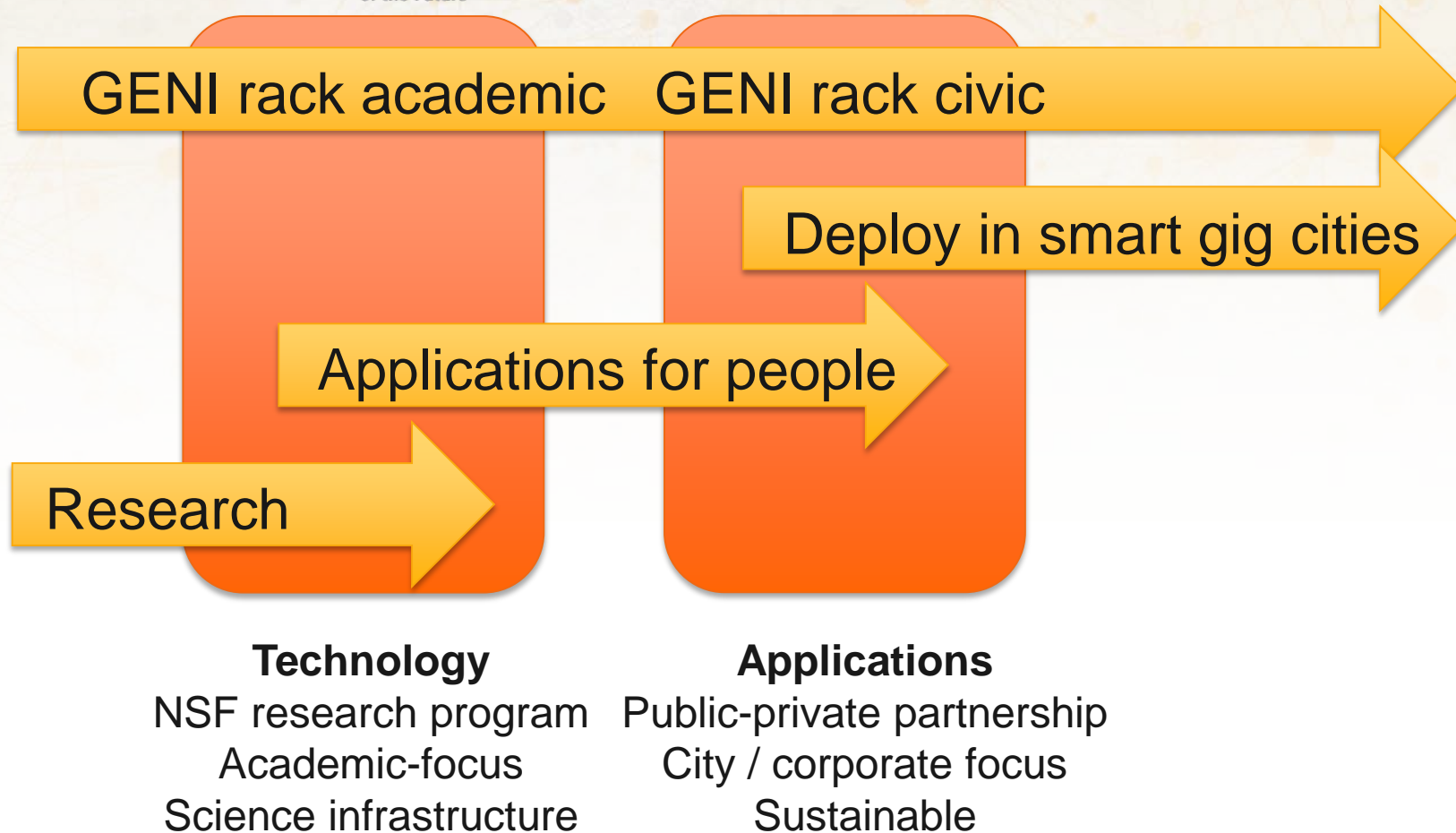
Slicing
Programmability
Distributed

+

GO FASTER THAN EVER
WITH INTERNET SPEEDS UP TO
1 GIG.

Salt Lake City Skyline

JUNIPER
NETWORKS
Comcast
CISCO
verizon
Extreme
networks
e
amazon
Google fiber
METRO
DEVELOPMENT GROUP
hp

usignite Applications for

= Smart Gigabit Cities

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amazon web services
Seattle, WA

mozilla
Mountain View, CA

-- CITY OF --
Ammon, ID

-- CITY OF --
Winthrop, MN

Lafayette Commerce
Lafayette, IN

-- CITY OF --
Flint, MI

-- CITY OF --
Philadelphia, PA

Comcast
Philadelphia, PA

JUNIPER NETWORKS
Sunnyvale, CA

ATC
Albion, ID

-- CITY OF --
Salt Lake City, UT

-- CITY OF --
Red Wing, MN

CHARLES STEWART MOTT FOUNDATION
Flint, MI

Google
San Francisco, CA

CISCO
San Jose, CA

-- CITY OF --
Orem, UT

HBC
Winona, MN

verizon
New York, NY

merit NETWORK INC
Ann Arbor, MI

-- CITY OF --
Burlington, VT

-- CITY OF --
Provo, UT

utopia
Utah

-- CITY OF --
Highland, IL

UC2B
Urbana, IL

-- CITY OF --
Dublin, OH

ONECOMMUNITY
Cleveland, Ohio

-- CITY OF --
Washington, DC

-- CITY OF --
San Leandro, CA

INTERNET2
Washington D.C.

-- CITY OF --
Blacksburg, VA

extreme networks
Santa Clara, CA

-- CITY OF --
San Francisco, CA

uen UTAH EDUCATION NETWORK WWW.UEN.ORG
Salt Lake City, UT

Jackson Energy Authority
Jackson, TN

-- CITY OF --
Jackson, TN

-- CITY OF --
Wilson, NC

-- CITY OF --
Raleigh, NC

JDSU
Milpitas, CA

cenic
La Mirada, CA

-- CITY OF --
Richardson, TX

GIG CITY CHATTANOOGA TN
Chattanooga, TN

DC-NET
Washington D.C.

-- CITY OF --
Durham, NC

hp
Palo Alto, CA

-- CITIES OF --
Kansas City, KS
Kansas City, MO

-- CITY OF --
Chapel Hill, NC

-- CITY OF --
Santa Monica, CA

big switch networks
Palo Alto, CA

ONF
Palo Alto, CA

-- CITY OF --
Austin, TX

FLR Florida LambdaRail
Tallahassee, FL

greenlight CABLE-INTERNET-PHONE
Wilson, NC

Research & Education Networks

Foundations & Non-profits

Network Operators

Municipalities

Corporations

LUS LAFAYETTE UTILITIES SYSTEM
Lafayette, LA

LAKE NONA
Orlando, FL

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Smart Gigabit Cities

TECHNOLOGIES

Gigabit wired / wireless fabric
GENI rack in each metro
Sensing + analyzing + acting

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Smart Gigabit Cities

Gigabit + in-city GENI rack

BIG

Data
4K Streaming video (including VR)

Quick

IoT / CPS smart sensors
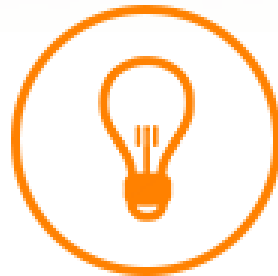Virtual reality
Ban web page wait

Sliced

Privacy
Security!
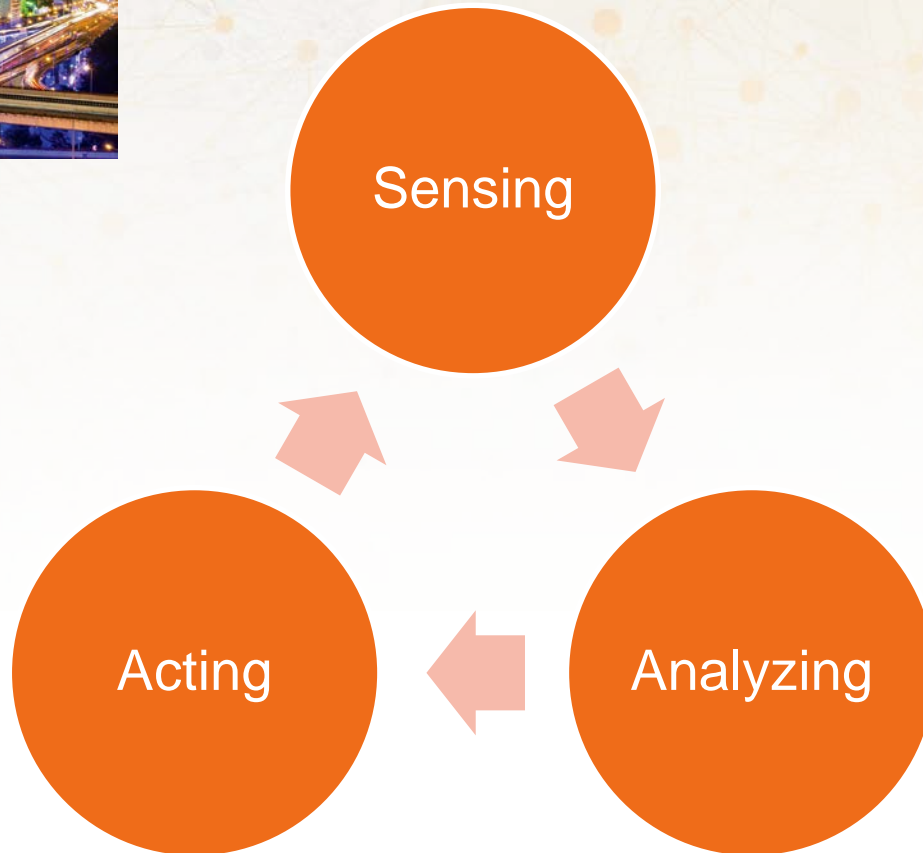
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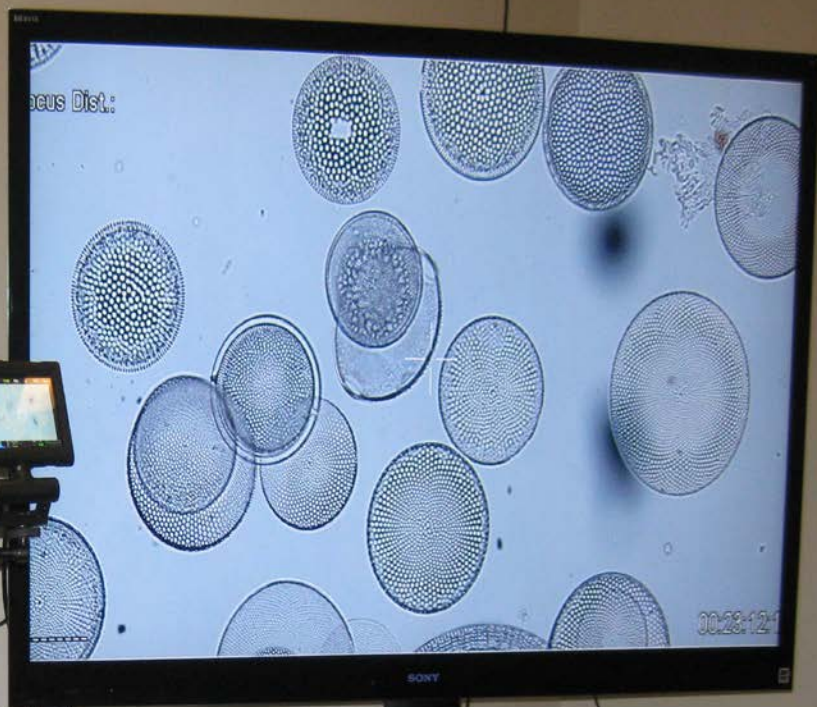Smart Gigabit Cities

National Priority Areas

Smart
City
Capabilities

Sensing

Analyzing

Acting

Smart Gigabit Cities

ORGANIZATIONAL

Inclusive partnerships
Sustainable business models
Open data

Sustainable Business Models

Common execution platform

Aggregate US Ignite cities as a common marketplace

Move academic solutions to commercialization

Economic development

Entrepreneurship

Corporate intrapreneurship

Open Data

Where feasible ...

Share de-personalized government data widely

Provide IoT data hub

Encourage publish / subscribe to allow additional uses of data

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Smart Gigabit Cities

A NEW BREED OF INTERNET APPLICATIONS

Nimble

Engaging

Collaborative

More secure

Applications for Smart Gigabit Cities

Firsts at "Smart Future 2015"

First inclusive conference from research to smart gigabit city deployment

First applications that needed more than a gigabit

First educational applications put into regular use in schools

Largest demo collection ever (60+)

First full demo block of smart-city IoT CPS applications

First participation by an European Commission Official

First international CPS smart city application (Toronto CVST)

First US Ignite Application involving collaboration in 5 countries simultaneously (Pollution Viewer)

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Glenn's Demo Picks
 4:30 pm – 7:30 pm Tuesday

3D Telerehabilitation
Adagio – Music Education
C3STEM – STEM Education
CloudLab – a "super" GENI rack
Connected collaboration
CVST* - Toronto transportation visualization
Drone firefighting
EON VR for Education
FIWARE
Physical Therapy as a Service*
PlanIT*
Pollution visualizer*
SCALE2* - Internet of Civic Things
SEACAT – Secure medical records
Viditor - Cloud based video editing
VR-based surgical training

DEMO Location – 22nd and I

IoT, CPS, Smart Cities

Small, inexpensive sensors (common)

Local, capable storage and compute (less common)

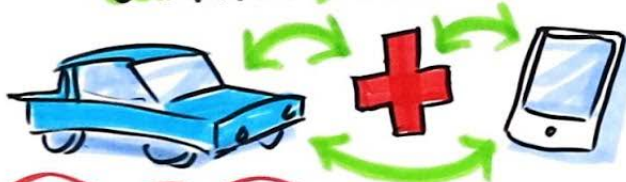Low latency, reliable network (critical)

Smart, adaptive, responsive systems

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TYPICAL APP CHARACTERISTICS

- Big data to the end user / anchor institution
- Visual data exploration ("fly-through")
- Virtual reality / augmented reality
- Real-time (apparently instantaneous)
- Very low latency
- Reliable (no hiccups)
- Cyberphysical interactions
- Collaborative (in the moment)

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