KanseiGenie:
Status Summary and Prospectus
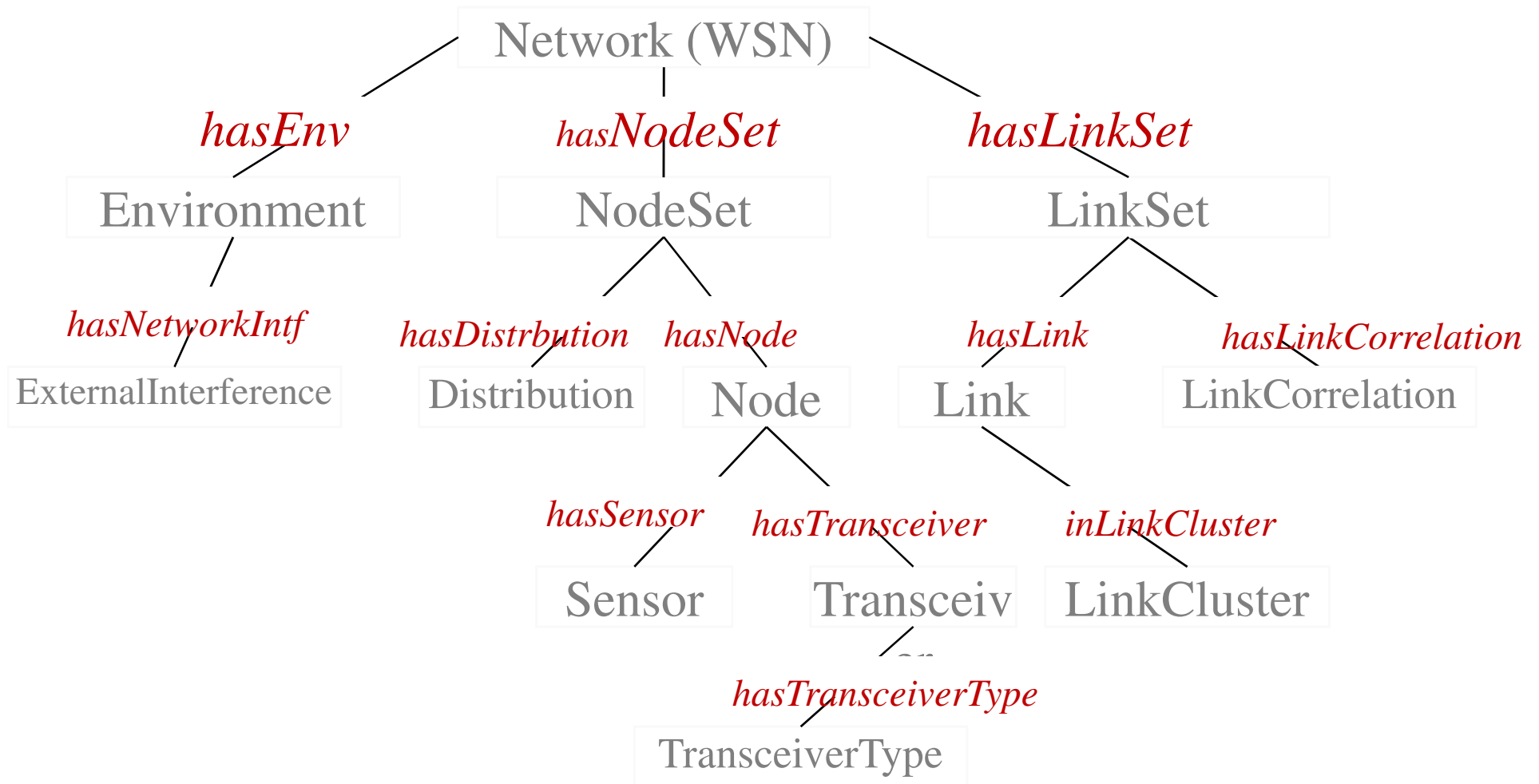
Anish Arora, Hongwei Zhang, Rajiv Ramnath,

Mukundan Sridharan, Wenjie Zeng, Xi Ju, Jing Li

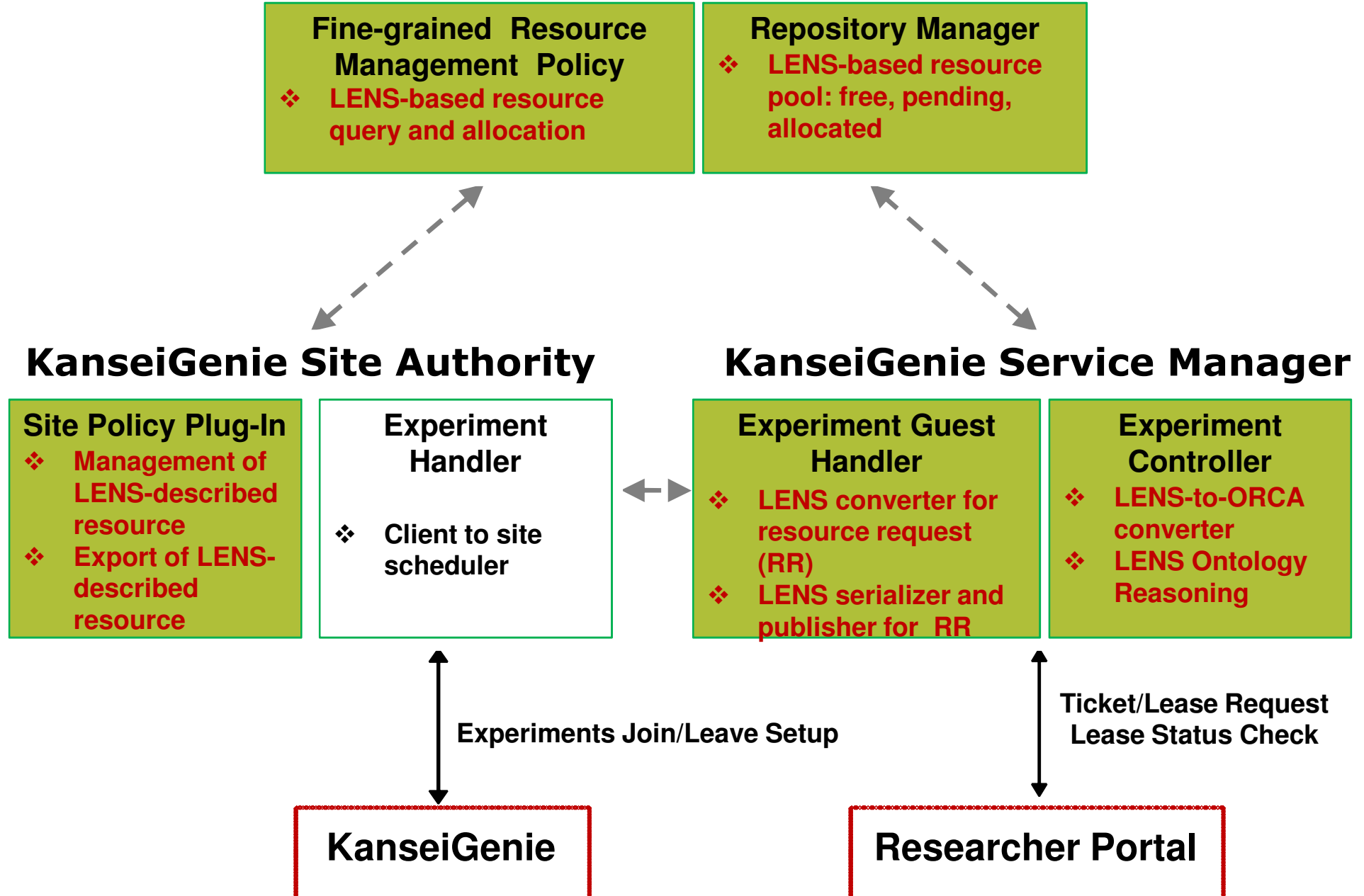March 17, 2011

Institute for Sensing Systems

THE OHIO STATE UNIVERSITY

Wayne State University

Los Alamos NATIONAL LABORATORY

Sun microsystems

Accomplishments
between GEC9 and GEC10

LENS: Language for Embedded Networked Sensing

Network (WSN)

hasEnv   *hasNodeSet*   *hasLinkSet*

Environment   NodeSet   LinkSet

hasNetworkIntf   *hasDistrbution*   *hasNode*   *hasLink*   *hasLinkCorrelation*

ExternalInterference   Distribution   Node   Link   LinkCorrelation

hasSensor   *hasTransceiver*   *inLinkCluster*

Sensor   Transceiv   LinkCluster

hasTransceiverType

TransceiverType

KanseiGenie Broker

Fine-grained Resource Management Policy
- ❖ **LENS-based resource query and allocation**

Repository Manager
- ❖ **LENS-based resource pool: free, pending, allocated**

KanseiGenie Site Authority

Site Policy Plug-In
- ❖ **Management of LENS-described resource**
- ❖ **Export of LENS-described resource**

Experiment Handler
- ❖ **Client to site scheduler**

KanseiGenie Service Manager

Experiment Guest Handler
- ❖ **LENS converter for resource request (RR)**
- ❖ **LENS serializer and publisher for RR**

Experiment Controller
- ❖ **LENS-to-ORCA converter**
- ❖ **LENS Ontology Reasoning**

Experiments Join/Leave Setup

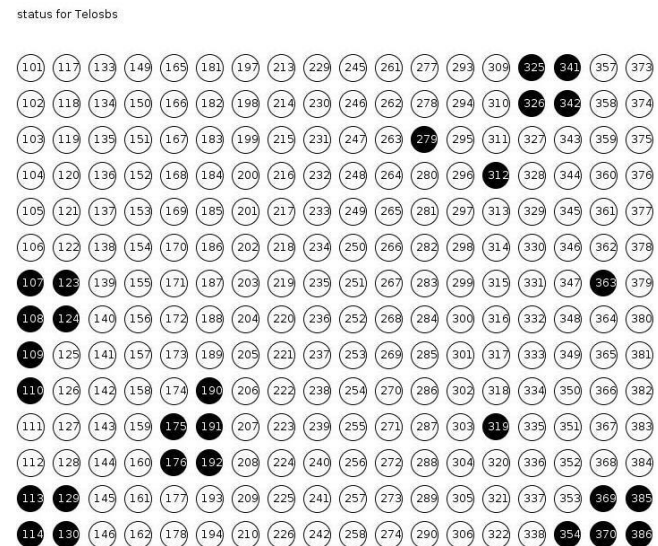**Ticket/Lease Request Lease Status Check**

KanseiGenie

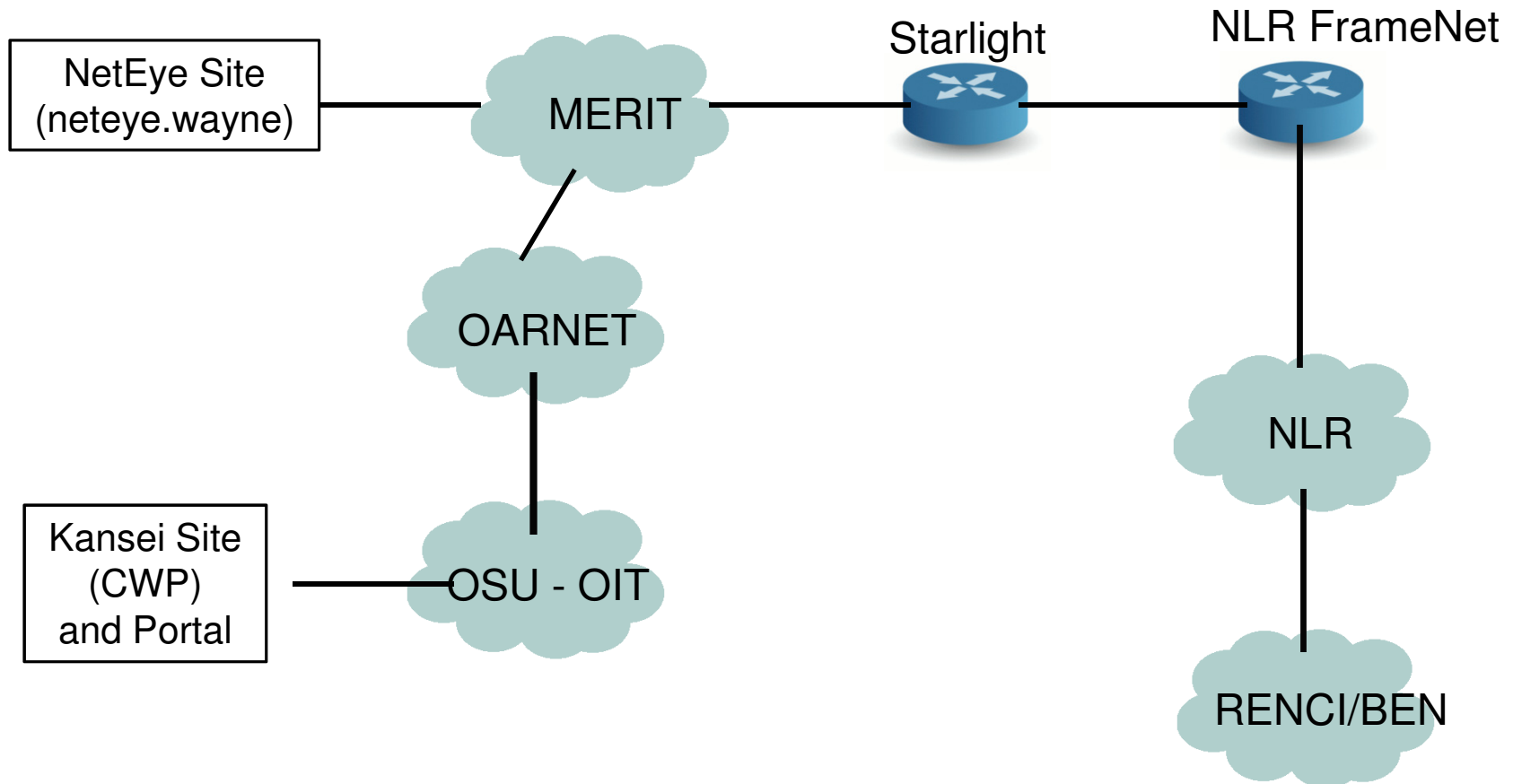## Researcher Portal

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KanseiGenie Doctor

- ## Reason about expt. Failures:
  - Experiment design?
  - Malfunctioning testbed ?
- ## Support heterogeneous platforms
  - Motes : TelosB, XSM
  - Stargates
  - Laptops
- ## Visual presentation of health status data

status for Telosbs

KanseiGenie VLAN Connectivity

"VLAN vs. Layer3" Switch

KanseiGenie Experiment Configuration

User Name	
IP address of user	136.145.215.82 (Your ip is logged)
Description	
Start Time Options	Date: March 16 Time: 11 32 ● Next Available ○ Absolute ○ Force
No of Site Choosen	2

Login Name	anish
User Email	
Length	10 Minutes
Connection Layer	● Layer 2 ○ Layer 3
Substrate Type	TELOSB

Site Name	kansei
Rspec ID	138

Rspec Name	AllbutOne
Slice ID	44

Future Plan

Future Plan

- Plan for the rest of spiral-3/project
    - Develop LENS-based resource embedding
    - Develop KanseiGenie experiment specification and control
    - Incorporate ORCA-based identity management

    - Continue supporting KanseiGenie experiments

- Longer-term goals (post-GENI-project initiatives?)
    - Keep expanding KanseiGenie consortium
    - Federate KanseiGenie with other substrates (e.g., cloud computing)

    - Measurement-based protocol/system reasoning

KanseiGenie Consortium

- **At-scale testing**
- **Multi-array applications**
- **Hybrid experimentation**
- Services-model of interaction
- Sensor data injection
- Object code, source code or high-level language input

- Sensor and mesh networking expt.
- Interactive experimentation control, sensing and control data injection
- Privacy-preserving user view control
- **Urban, health/occupational sensing**

Other Opt-in Arrays

LANL Array

Multi-Sensor Array

KanseiGenie

NetEye

Dreese Sensor Array

PeopleNet

15 802.11b/g laptops

130 TelosB motes

- **P2P social networking apps**
- **Environmental sensing: NOX, CO_2**
- **Mobility testing**

Cell-phone Psi-Mote Mobile Array

User Application ---
KanseiGenie Services ---
Client Services ---

Dreese Sensors
- Occupancy
- Elevator
- Temperature
- Anchor Nodes

- Location-specific user-supplied sensing (conference room occupancy, elevator location)
- Fabric virtualization

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