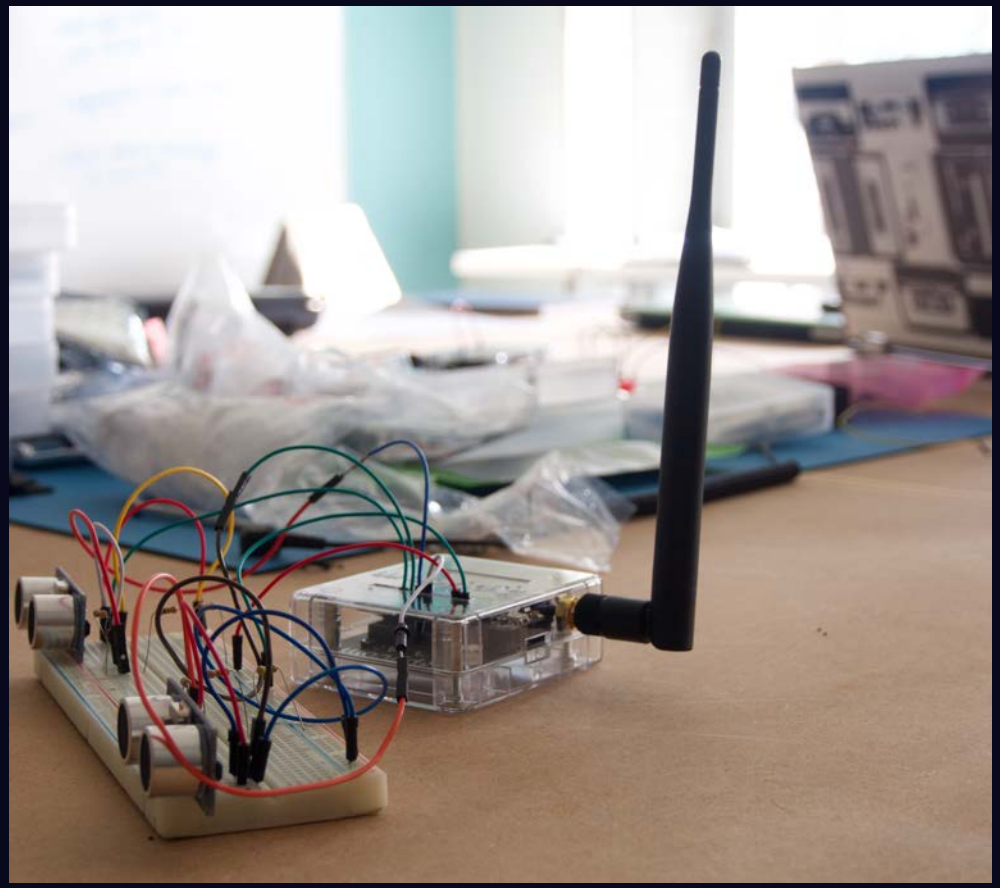
THE UNIVERSITY *of* EDINBURGH

http://iot.ed.ac.uk

University IoT Programme

Ewan Klein
Simon Chapple



LPWAN

- Low-Power Wide-Area Network
- Wireless
- Long-range communication between things
- Low bit rate
- Long battery life

LoRaWAN

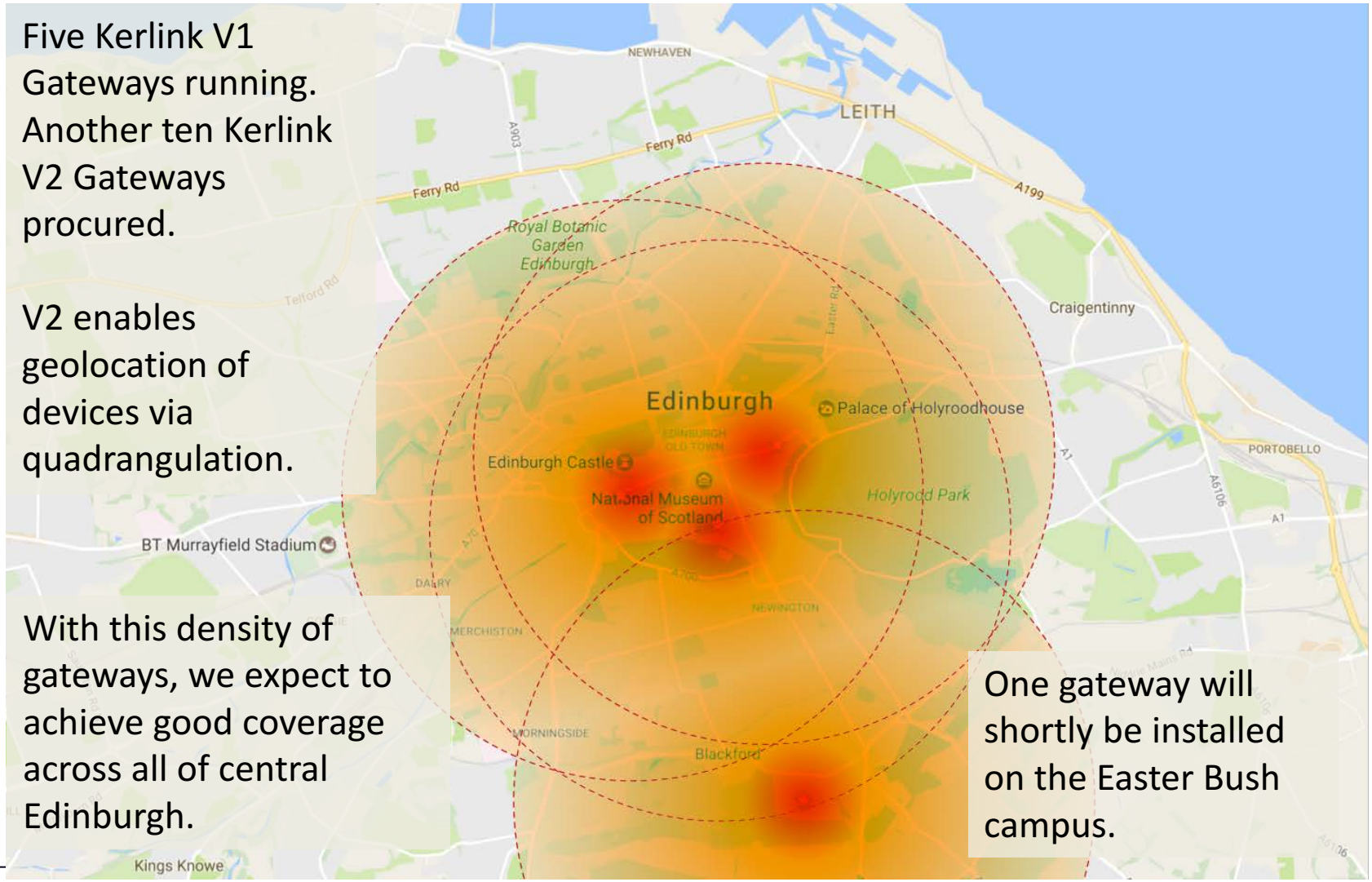
- One type of LPWAN
- Uses star topology:
  - A gateway relays messages between multiple end-devices and backend server
- Widely adopted globally, including the United States, Australia, New Zealand, Taiwan, Netherlands, India
- The Things Network global community build initiative
- Also deployed by CENSIS in Glasgow, and Digital Catapult in London (50 gateways)

THE UNIVERSITY of EDINBURGH

University LPWAN Research & Innovation Infrastructure

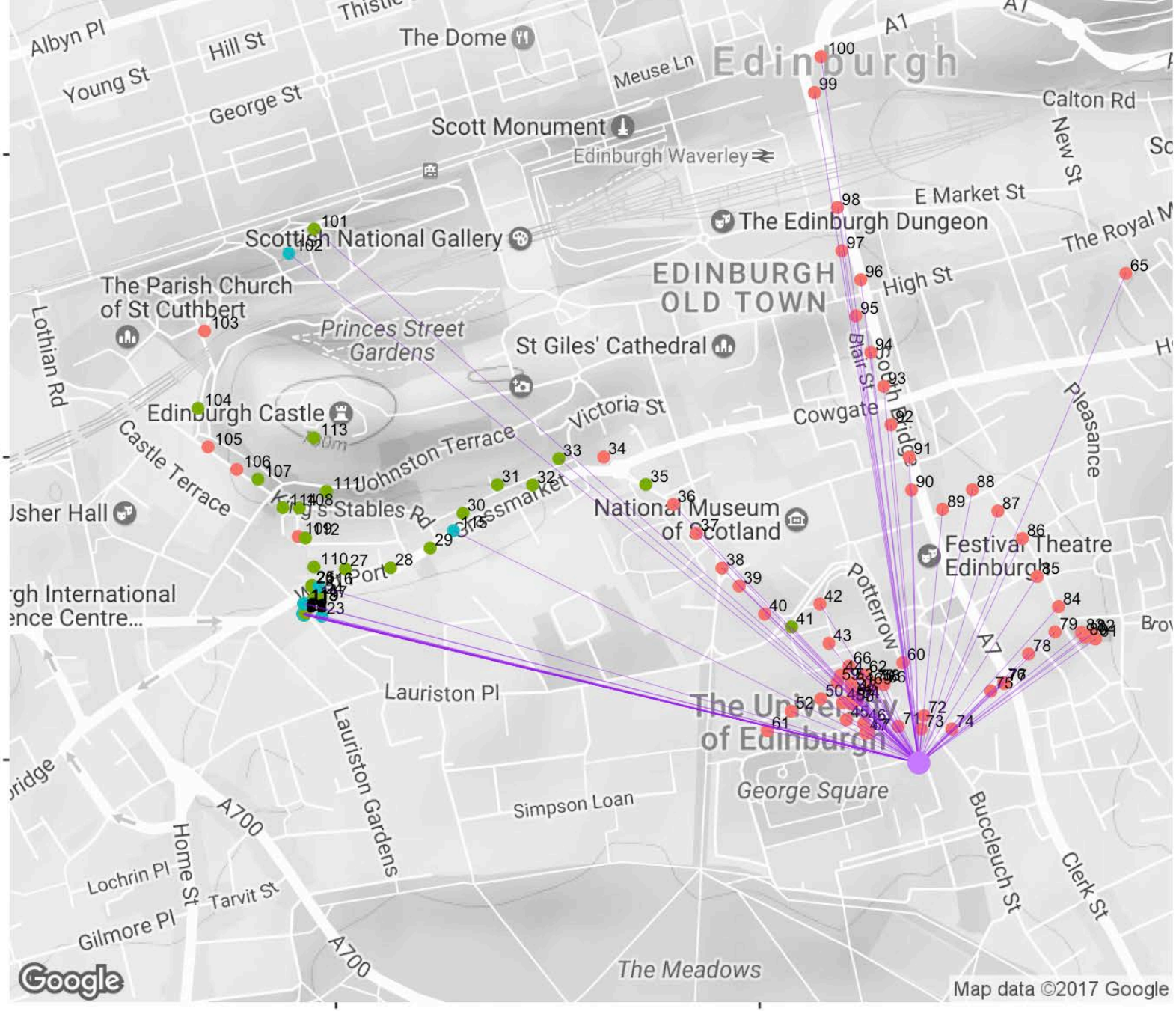
Five Kerlink V1 Gateways running. Another ten Kerlink V2 Gateways procured.

V2 enables geolocation of devices via quadrangulation.



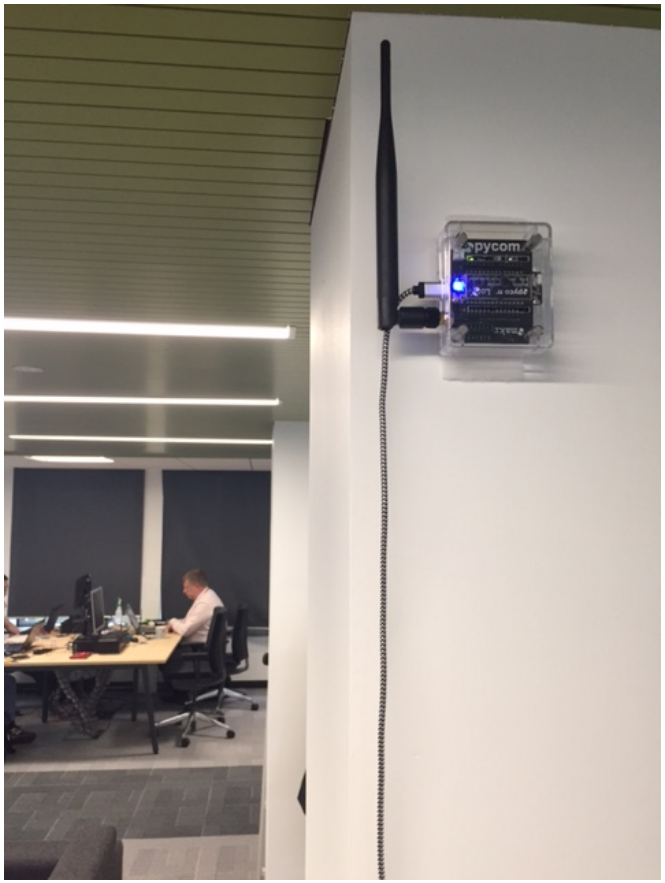
With this density of gateways, we expect to achieve good coverage across all of central Edinburgh.

One gateway will shortly be installed on the Easter Bush campus.


Albyn Pl
Hill St
Young St
George St
The Dome
Meuse Ln
Edinburgh
A1
Calton Rd
New St
Scott Monument
Edinburgh Waverley
E Market St
The Edinburgh Dungeon
The Royal M
Scottish National Gallery
EDINBURGH
OLD TOWN
High St
The Parish Church
of St Cuthbert
Princes Street
Gardens
St Giles' Cathedral
Lothian Rd
Blair St
Cowgate
Pleasance
Edinburgh Castle
Victoria St
Castle Terrace
Johnston Terrace
Usher Hall
King's Stables Rd
Grassmarket
National Museum
of Scotland
Festival Theatre
Edinburgh
Potterrow
A7
Lauriston Pl
The University
of Edinburgh
George Square
Simpson Loan
Lauriston Gardens
Buccleuch St
Clerk St
Home St
A700
Lochrin Pl
Tarvit St
Gilmore Pl
The Meadows
Google
Map data ©2017 Google
952
948
944
-3.20
-3.19
George Square Gateway
gateways
1
2
3
George Square

Argyle House

Argyle House: meeting room occupancy



Estimote Beacons (Bluetooth)

- Smart cushion with with Force Sensitive Resistor
- presence, movement, temperature, light level

LoPys = Local Sensor Hubs

- collect data from beacons
- transfer to backend server over LoRaWAN

Currently deployed:

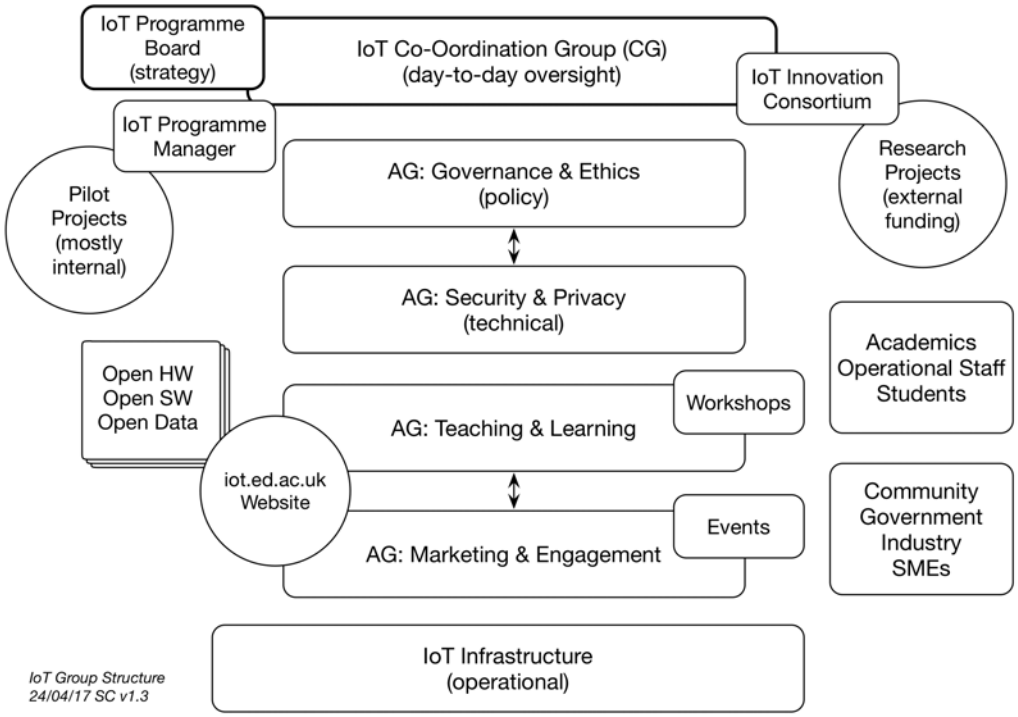
- E4 meeting room
- K-East & K-West
- F-East & F-West
- 9 Sensor Hubs, 58 beacons
- 114 recorded sensor readings every 2 minutes

Questions

- How can we use visualisation to explore and understand the data?
- What are the views of staff in Argyle House about the data collection?

Main IoT Programme Goals for 2016/17

1. Establish IoT communications infrastructure on University estate
2. Experiment with infrastructure and sensors via a small set of pilot projects
3. Establish a governance framework to manage the IoT Programme
4. Address specific areas of concern/importance with focused ‘action groups’



5. Establish IoT Innovation Consortium for startups, SMEs, government, civic science…