

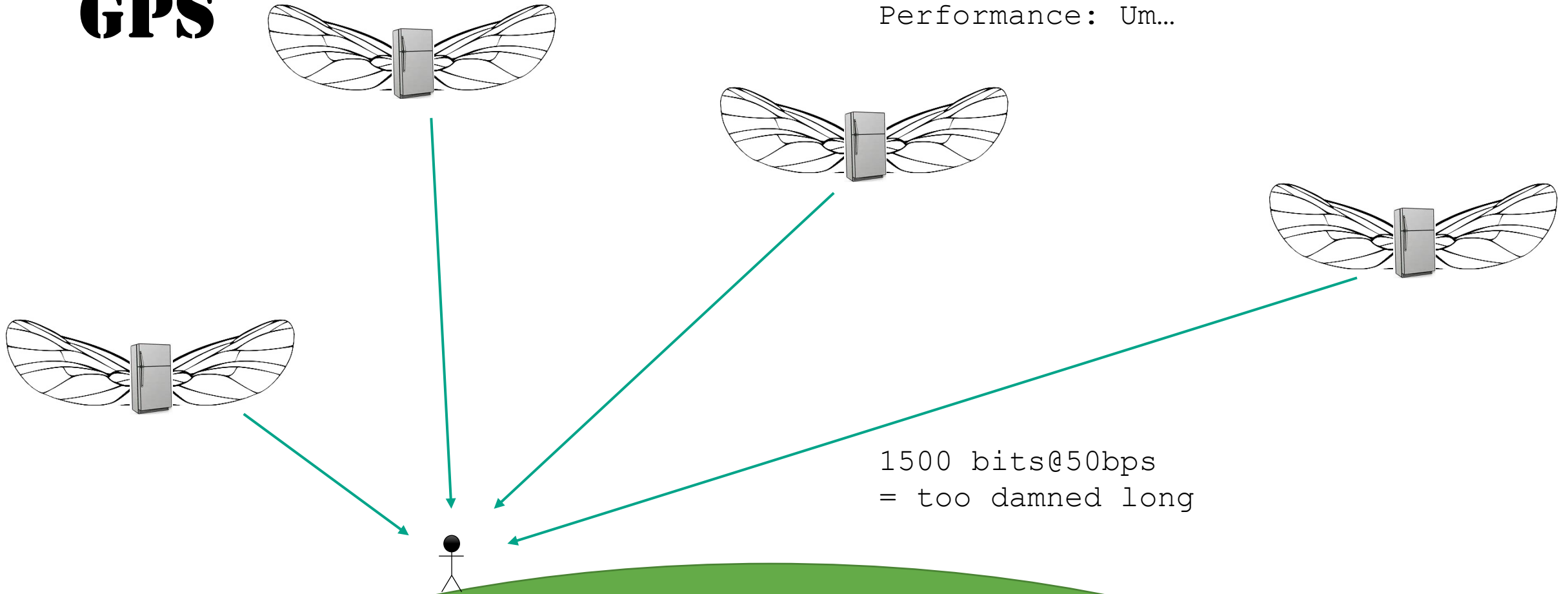


HOW THEY KNOW WHERE YOU ARE

GEOPRIV@IETF88

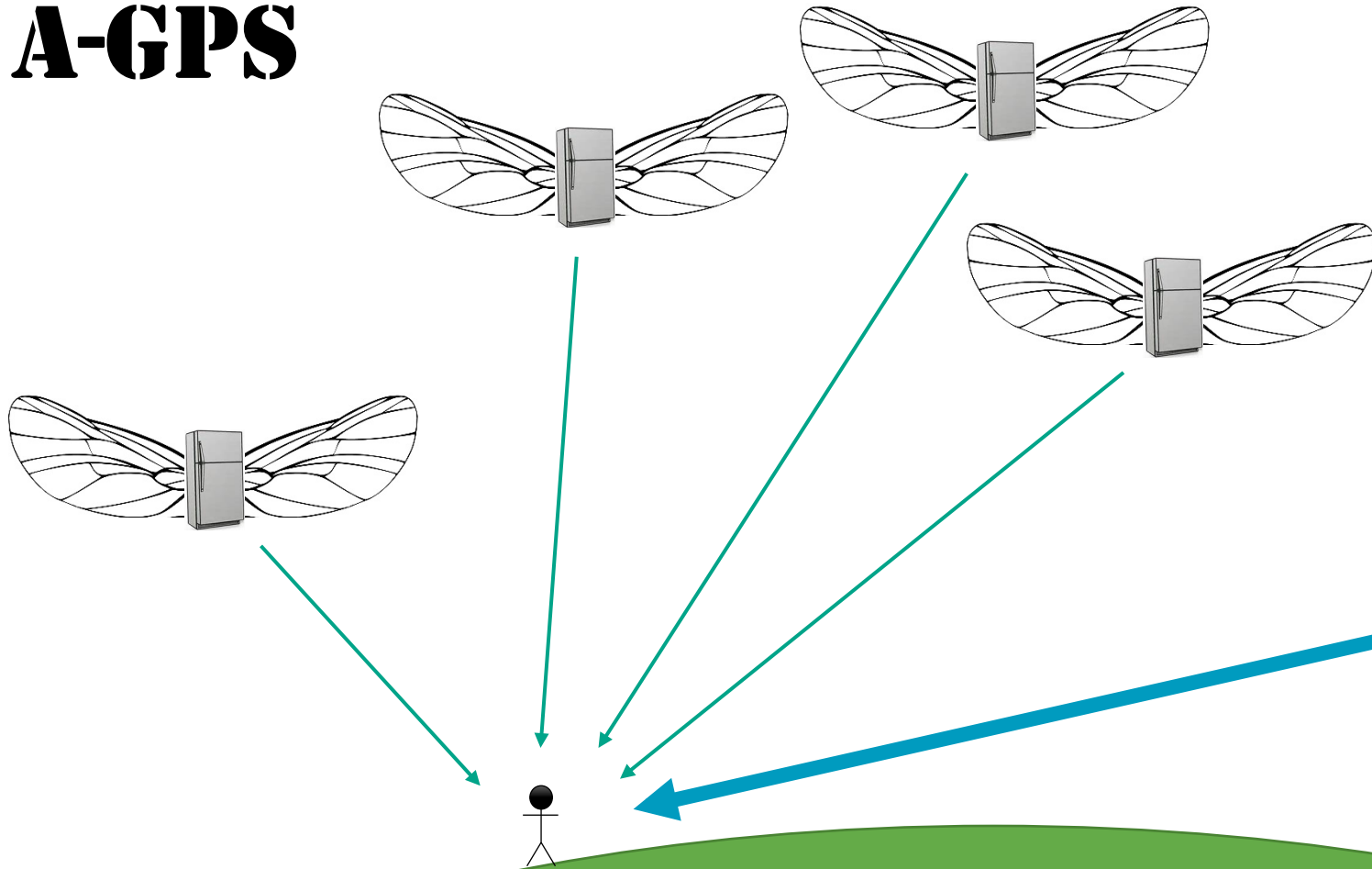
GPS

Privacy/Surveillance: OK
Performance: Um...



1500 bits@50bps
= too damned long

A-GPS



Terrestrial networks
are waaaay faster
Send ephemeris that way

A-GPS MODES

- Device-based
 - “I am here, send me ephemerides”
 - Often tied to another location technology
 - Cell-based positioning is often performed by the server
 - A very coarse seed is often sufficient
 - Device performs final calculation
- Device-assisted
 - “Duh...”
 - Can use arbitrarily-accurate location
 - Fast methods are preferred
 - Server tells Device where to look for signals
 - Device just looks for signals and reports code phases
 - Server performs final calculation

CONTROL VS. USER PLANE

- Initial A-GPS deployments used the cellular control channels: SLOW
- Secure User Plane Location replaces that
 - Operates over the Internet
 - “Secure” because it’s TLS
 - Inherits most of the architectural characteristics
 - Server command and control
 - Roaming arrangements and policy enforcement models
 - Application requests a core part

REALITIES OF SUPL DEPLOYMENT

- A few very large providers
 - Cellular carriers and mobile OS vendors
- All of these have your location
 - Even in Device-initiated, Device-based A-GPS, the server tends to get a copy of the result
- SUPL is typically baked into silicon and not visible to the mobile OS
 - Most people don't even know how to access config
 - “Go to the phone's dialer and enter the number ##1472365##”
- Disabling the GPS is for most, the only option

A SOLUTION

- Make assistance data free
 - GPS does anyway
 - Just make it available faster
- No strings attached
 - Don't request location-specific assistance
- ...but
 - This field is IPR-rich and many have staked a claim
 - No strong incentive to give assistance data away
 - Invalidates some location integrity options

OTHER LOCATION TECHNOLOGIES IN ACTIVE, WIDE DEPLOYMENT

- WiFi access point databases
 - Servers almost mandatory due to volume of data
 - Servers use GPS results to improve their datasets
- Cell-based and enhanced cell-based
 - Based on existing network/radio management data
 - Some use Device-reported measurements
- OTDOA and UTDOA
 - Based on observed time difference of arrival at Device or cell towers respectively
 - OTDOA uses Device measurements; again probably invisible
 - UTDOA is measured in the network; can be done without Device being aware that it is happening; kinda pricey though