

Jim Sauerwein

CONNECTED FREIGHT

Towards a Zero Delay Supply Chain

Honeywell
THE POWER OF **CONNECTED**

Why Visibility is so Important

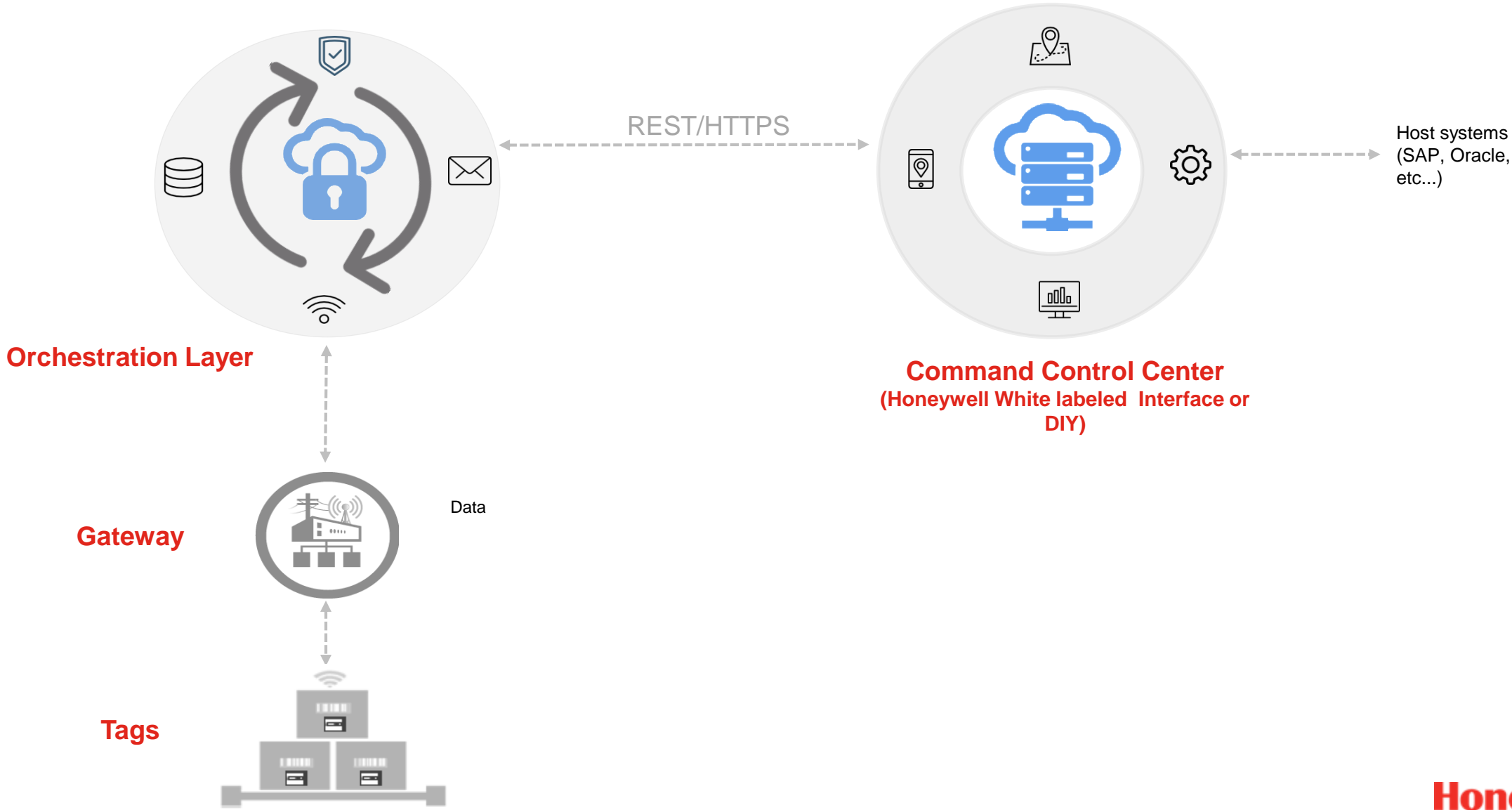
- **30%** of all shipments are damaged or delayed
- **30%** of all perishable goods don't reach end destination
- **\$60B** economic value was lost due to theft
- **1 in 5K** shipments travelling < 300 miles “victimized”
- **1 in 10K** shipments travelling >300 miles “victimized”



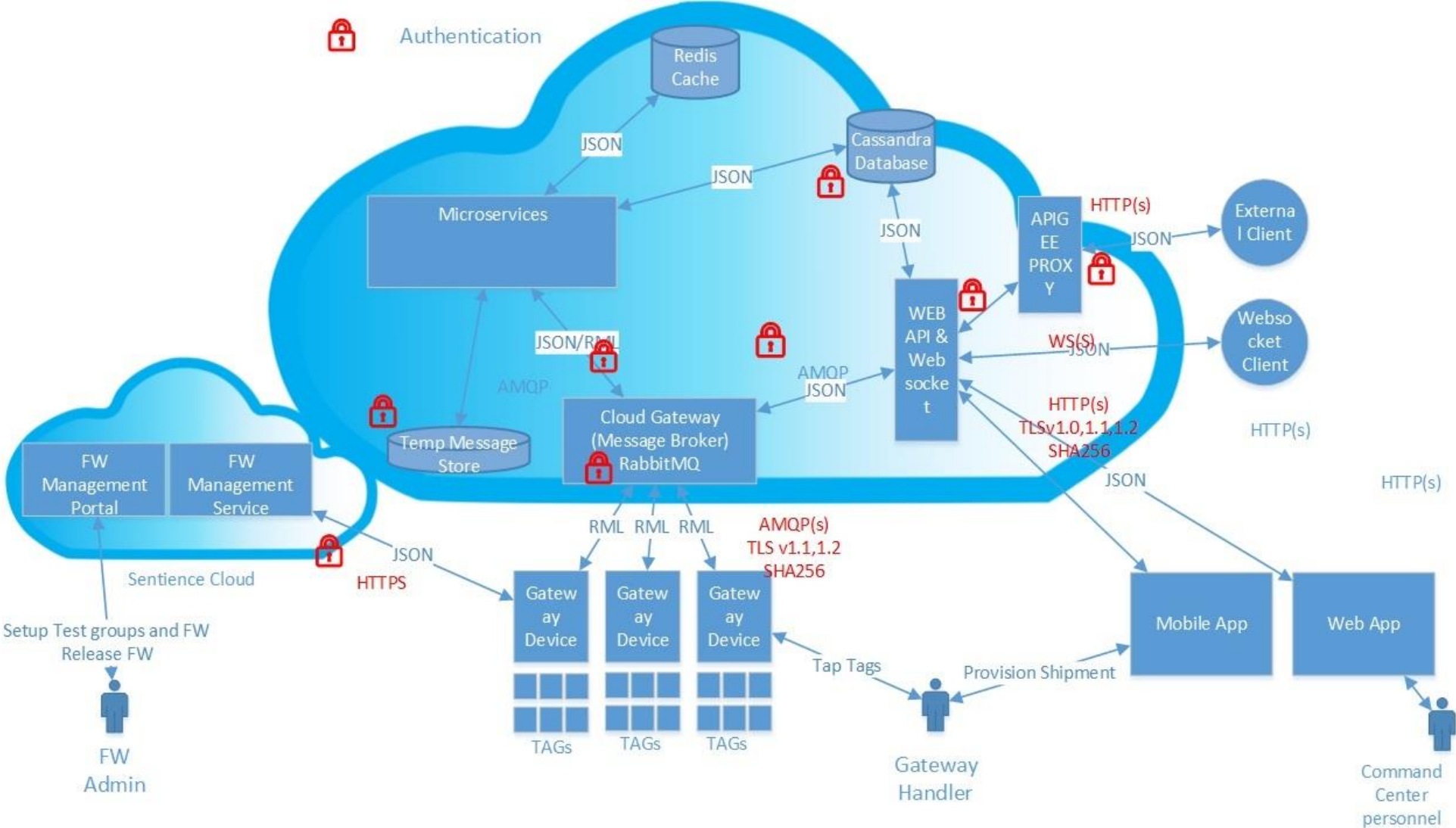
Source : Jabil SCM report - April 2015

Where are my goods? What condition are they in? Are they secure?

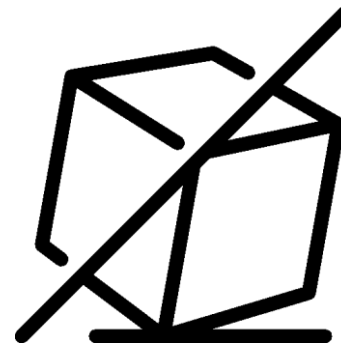
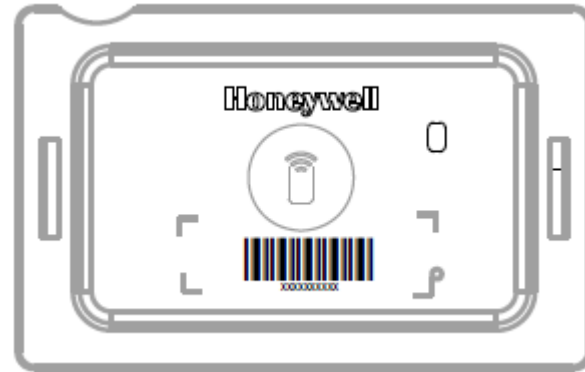
System Architecture



Logical Architecture

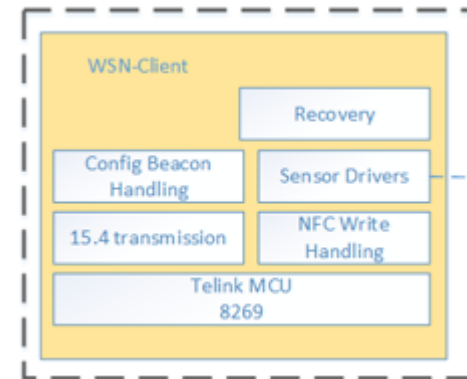
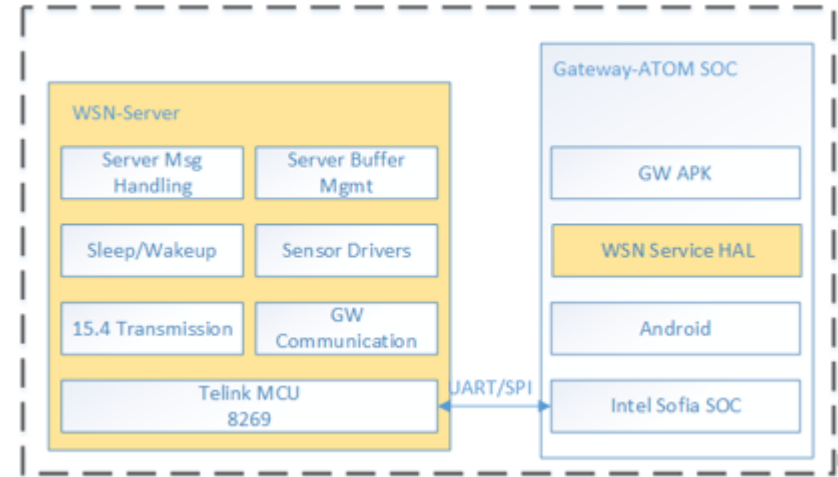
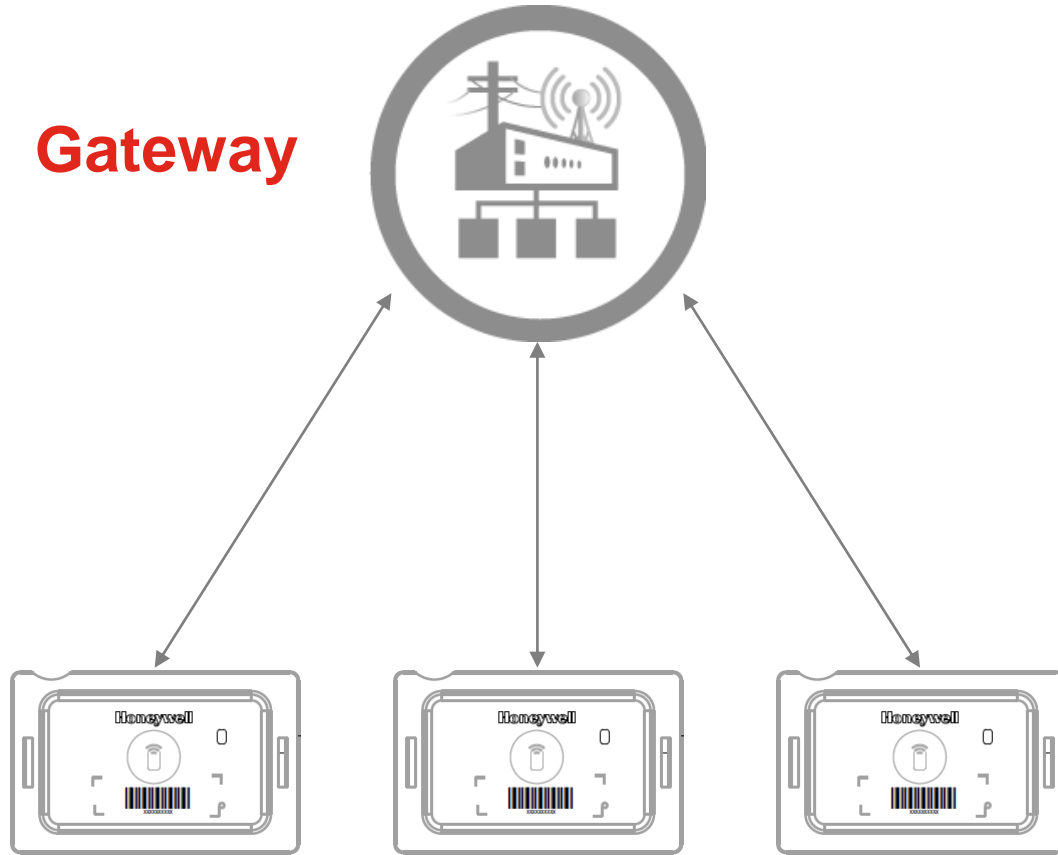


Anatomy of a smart tag



Wireless Sensor Network

Gateway



Dynamic Network optimized for reliability and power management

WSN In action



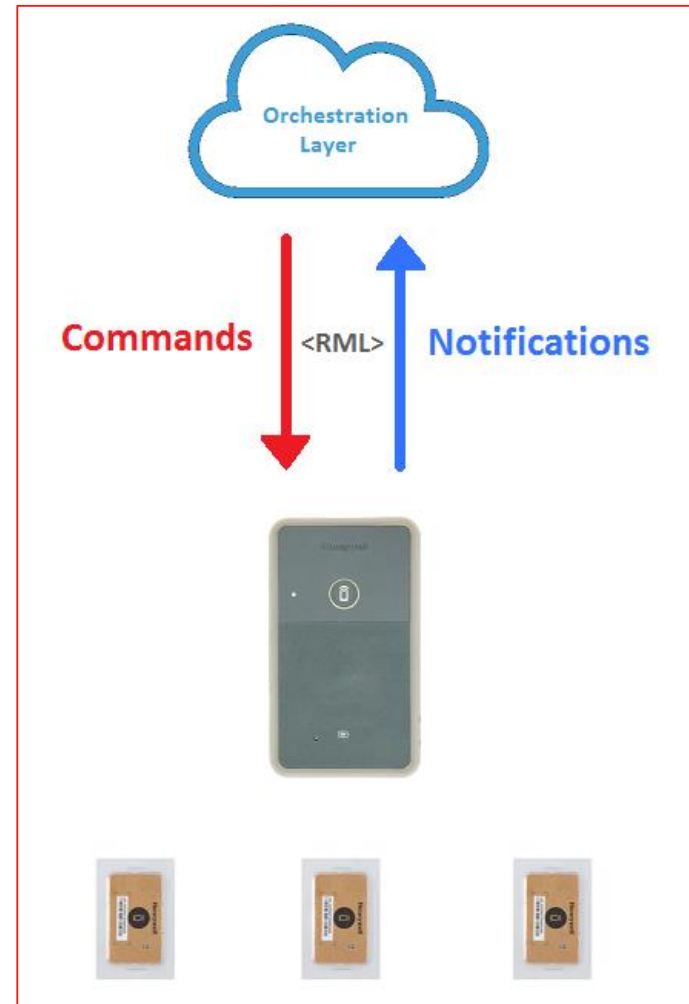
Beacon RX

Data TX from each client

Network design minimizes balancing requirements

Data flow

- The gateway understands a series of XML messages formatted as Remote Markup Language (RML).
- RML is an XML schema developed by Honeywell to describe the source and destination of a message, as well as the verbs (actions) and nouns (properties) of a message.
- An RML message can take the form of either a “Command” or a “Notification”.
- The gateway accepts commands and sends notifications.
- Commands will only be received by the gateway while it is connected to the orchestration layer, however, the gateway may send a notification at any time.



Solution Components - Command Control Software

Monitoring - All Shipments (LAST REFRESHED AT : 2017-05-01 20:20:31)



LAST 5 ALERTS OF ACTIVE SHIPMENTS

BREACH TYPE	TIME/DATE	SHIPMENT	SHIPPER
	2017-05-01 20:17:28	USI1TEST210417	HONEYWELL
	2017-05-01 20:16:58	USI1TEST210417	HONEYWELL
	2017-05-01 20:16:58	USI1TEST210417	HONEYWELL
	2017-05-01 20:16:58	USI1TEST210417	HONEYWELL
	2017-05-01 20:16:58	USI1TEST210417	HONEYWELL
	2017-05-01 20:16:58	USI1TEST210417	HONEYWELL

ALERT	SHIPMENT ID	SHIPMENT REF#	STATUS	ORIGIN	DESTINATION	DELIVERY DATE
	Lynwood_Suite43_E 2E	Lynwood_Suite43_E2E	Completed	Hampton 19324 Alderwood Mall Pkwy, Lynnwood USA 98036	Honeywell 16201 25th Ave W, Lynnwood USA 98087	2017-05-01 18:02:00
	IAP44055	IAP44055	Active	Professor Jayashankar Telangana State Agricultural University Rajendranagar, Hyderabad, Telangana India 500030	Survey No. 115, 11, IT Park Road Number 2, Financial District, Nanakram Guda, Hyderabad Telangana India 500032	2017-05-01 12:00:00
	28APR_DEVTEST	28APR_DEVTEST	Active	Cyient Ltd, Plot no-2, IT Park, ISB Road, Nanakramguda, Gachibowli, Near Continental Hospital, Financial District, Nanakram Guda, Hyderabad, Telangana 500032	Honeywell Technology Solutions, Survey No. 115, 11, Rd Number 2, Financial District, Nanakram Guda, Hyderabad, Telangana 500032	2017-04-29 20:44:00
	27APR_DEVTEST	27APR_DEVTEST	Completed	Cyient Ltd, Plot no-2, IT Park, ISB Road, Nanakramguda, Gachibowli, Near Continental Hospital, Financial District, Nanakram Guda,	Honeywell Technology Solutions, Survey No. 115, 11, Rd Number 2, Financial District, Nanakram Guda, Hyderabad, Telangana 500032	2017-04-28 23:59:00

Refresh

Create Shipment

Back

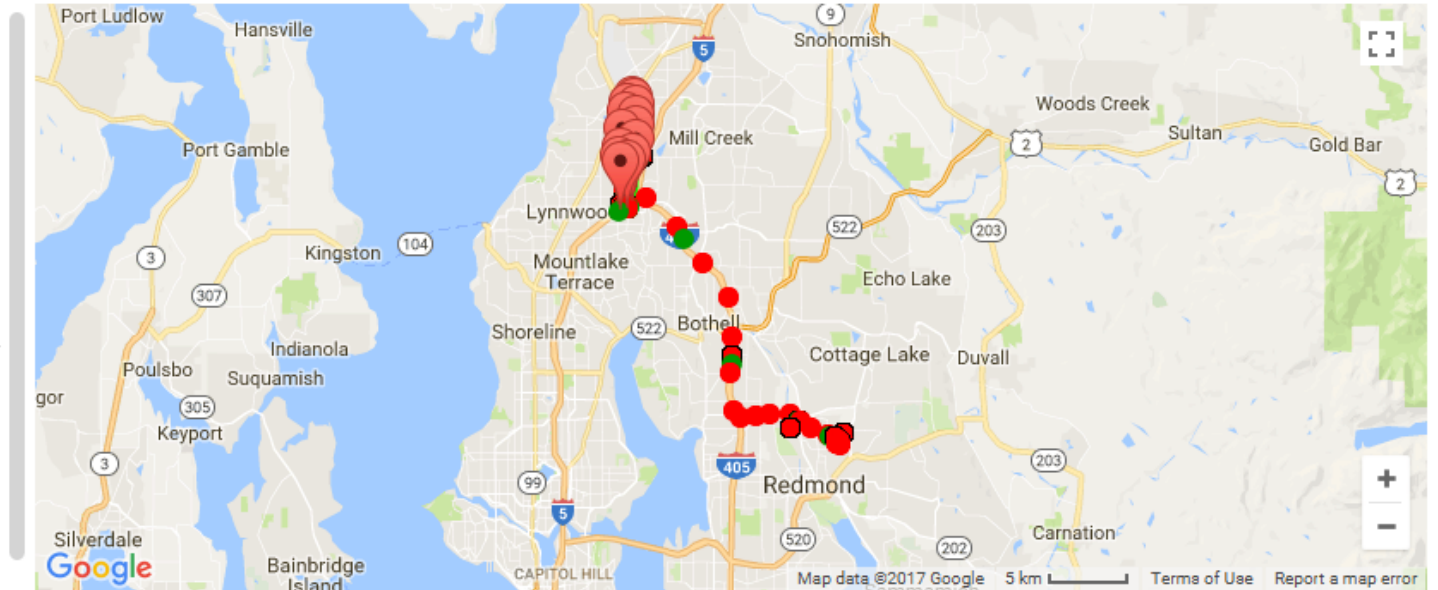
Command Control: Near Real-Time View of Your Goods

Shipment Details Monitoring - Lynwood_Suite43_E2E, GTW (17039D815B), 3 Tags, 3 Pallet(s), 0 Document(s) (LAST REFRESHED AT : 2017-05-01 20:26:08 LAST EDITED BY : @phanikrishna.lanka.desktop@honeywell.com)

SHIPPER ID : Lynwood_Suite43_E2E
 TRANSPORT COMPANY NAME : DHL
 RECEIVER : Honeywell
 DESTINATION : Honeywell
 ORIGIN : Hampton
 ANTICIPATED DELIVERY WINDOW : 2017-05-01 18:02:00 - 2017-05-01 18:02:00
 REPORTING FREQUENCY : 5 (min/s)

FEEDBACK

Gateway status: Powered ON (LED on NFC button blinks green 3 times upon pressing the power button once)
 Tag status: Powered On and functional (See 2 quick green flashes every 30/60 secs)
 Additional comments:
 Rating (0-5 stars): 0 stars



TEMPERATURE:(0 °C - 30 °C), HUMIDITY:(0 - 100), SHOCK:(4000), TILT:(90), LIGHT:(0 - 1000)

TYPE	TIME/DATE	COMMENT
🔒	2017-05-01 14:39:40	Temperature breach on Pallet : 17038D81AE @ 0.0
🔒	2017-05-01 14:39:40	Temperature breach on Pallet : 17010DF05E @ 0.0
🔒	2017-05-01 14:39:40	Humidity breach on Pallet : 17010DF05E @ 0.0
🔒	2017-05-01 14:39:40	Humidity breach on Pallet : 17038D81AE @ 0.0
🔒	2017-05-01 14:34:40	Temperature breach on Pallet : 17038D81AE @ 0.0

GTW HEALTH	TAG HEALTH	TEMPERATURE (C)	HUMIDITY	SHOCK (G)	TILT	LIGHT (Lux)
●	●	●	●	●	●	●
Battery: 80%	Tag ID : 336B Battery : 2677.0 Tag ID : 3149 Battery : 2751.0	Pallet 17038D81AE has highest breach count of 349 and breach duration of 1683 min(s) High: 30.0 Low: 0.0	Pallet 17038D81AE has highest breach count of 349 and breach duration of 1683 min(s) High: 53.0 Low: 0.0	Pallet 17010DF05E has highest breach count of 2 High: 6000.0 Low: 800.0	Pallet 17010DF05E has highest breach count of 1713 High: 124.0 Low:	Breach Count: 0 Breach Duration: 0 mins
Refresh						