



## DroidCON III: After Hours

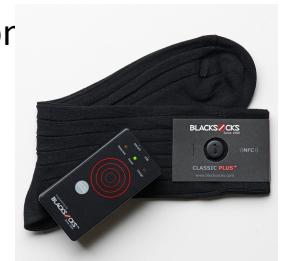
Lets talk about RFID...

### Overview

- » RFID Introduction
- » Unique User ID (UUID)
- » How RFID Works
- » Introducing
- » Beacons
- » Meta Data
- » Readers
- » Disney's MagicBands
- » SDK Framework
- » Use Cases
- » Supportive Infrastructure
- » Q & A

### RFID Introduction

- » Radio Frequency Identification
- » Readers & Tags
- » Variety of RF bands
  - » Near Field Communications
  - » LF, HF, UHF, MicroWave
- » Common RFID Uses
  - » Security Tags - Books, Clothing
  - » Door Access KeyCard
  - » Transportation System Access



## UUID

\_UNIQUE User Id (Universally Unique ID)

Just a number

Various Lengths

4 Byte (32 bit)

4,294,967,295

7 Byte (56 bit)

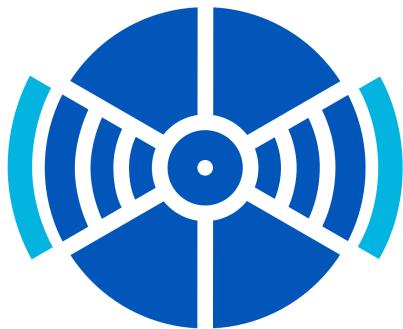
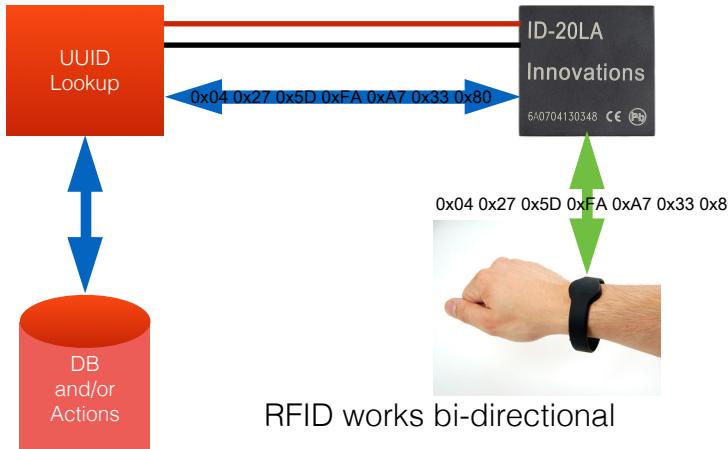
0x04 0x27 0x5D 0xFA 0xA7 0x33 0x80  
9,223,372,036,854,775,807

16 Byte (128 bit)

39 Digits!!

Even larger

## How RFID Works



Introducing R2FID

## R2FID

Multiple Hardware Devices with Integrated Software Frameworks

R2FID Beacons & GeoFencing

BlueTooth BLE 4.0+ emitter

iOS & Android SDK

Independent & integrated into R2FID Reader

R2FID Reader for Droids

BlueTooth BLE Beacons

Disney's Magic Bands - Just works

MiFire Classic RFID Tags - Allows for Custom Tags

Independent of R2FID iBeacon

RSeries I2C Bus embedded support

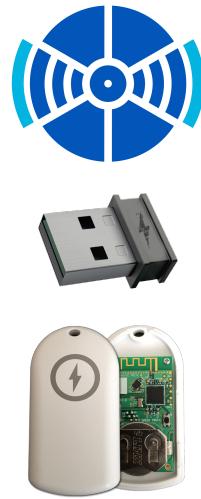
## R2FID - cont.

### Software

- Nothing propagates, all done in reader firmware
- Recognizes 16 characters via Magic Band
- Actually 9,223,372,036,854,775,807 characters

### MiFare Classic Tag

- Allows for assignment of specific characters
- We don't use the UUID on MiFare
- Stored in ROM of the tag
- Easy to adapt, easy to use, easy to print on



## R2FID Beacons

- Commercially available by Radius Networks RadBeacon
- USB Powered Device - Can work in ANYONE's droid!
- Plugs into R2FID Reader Board or AC PS for POWER Only
- TAG is a button cell battery powered wearable tag for Costuming
- Specific HW UUID
- Major & Minors for specific uses
- Major: Classification of #
  - 1=Testing Droid ID
  - 2=Droid Builder ID
  - 3=Protocol Droids
  - 4=C7 Scavenger Hunt Items
  - 6=MSE Droids
  - 7=JEDI
  - 501=501st Legion Members
- Minor:
  - Droid Name & Who's Droid
  - Celebration Droid Hunt Droid
  - Scavenger Hunt Items
- UUID, Major, Minor & Meta Data
- Maintained by REON and hosted on Radius Networks Cloud

## R2FID iBeacon Use Cases

### Geo-Fencing

- No HW iBeacon needed for Geo-Fences proximity
- Cloud retrieved GPS location via SDK

### Micro-Proximity Location Services

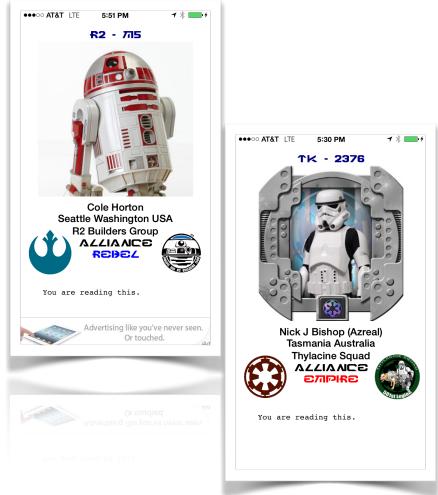
### Scanner iOS & Android App

- Character information pops up on the screen as you approach
- Events pop up on device
- Room layout, shows where users are
- Facts or trivia as they walk around, including Droid specs

### Interactive Games

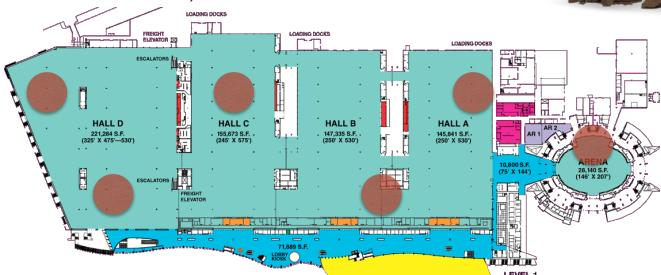
## Custom Meta Data

- Meta Data stored on R2FID Cloud Services
- Updated via SDK from Cloud via SDK Sync
- R2 Builders Group:
  - MAJOR: 2 (Droid ID)
  - MINOR: 0-65535
  - CHAR\_ID: R2-D2
  - CHAR\_TYPE: 2
  - NAME: Brett Bourbin (Selgus)
  - LOCATION: Orlando Florida USA
  - REGIONAL\_GROUP: R2 Builders Group
  - REGIONAL\_IMG\_URL: <http://www.rseries.net/r2fid...>
  - IMG\_URL: <http://www.rseries.net/r2fid/images/image2>
  - ALLIANCE: Rebel
- 501st Example:
  - MAJOR: 501
  - MINOR: 2376
  - CHAR\_ID: TK - 2376
  - CHAR\_TYPE: 501
  - 501\_ID: 2376
  - NAME: Nick J Bishop (Azreal)
  - LOCATION: Tasmania Australia
  - REGIONAL\_GROUP: Thylacine Squad
  - REGIONAL\_IMG\_URL: <http://www.rseries.net/r2fid...>
  - IMG\_URL: <http://www.rseries.net/r2fid/images/image2>



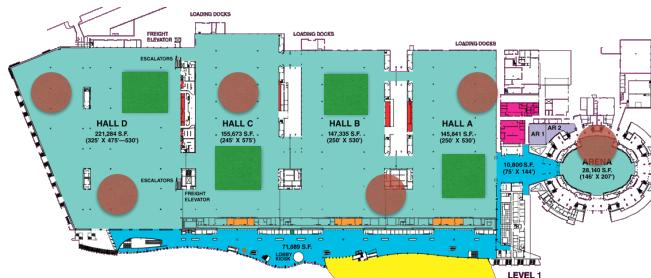
## Scavenger Hunt

- Find & collect 6 droid "good" droid parts "Found: Good Motivator" with image
- Some Droid Pieces are "Broken" ... "Found: Bad Motivator, sorry" broken image of part shows up
- iBeacons scattered across the entire convention center, move some daily
- Proximity range ~10m (but we can make some smaller)
- Character Standee marks the location that day
- Standee has the instructions on it, on how to play the game!
- Easily can include hotels lobbies, used to drive attendees to various focus areas



## CON Information

- Informational POP Ups
- URL Redirects
- Club Data
- Builders Room Layout Map & Information
- Droid, Part Identification... Informational Kiosk



## Trooper Droid Hunt

- Find 8 correct droids
- 12 droids are picked at random, each day.
- Attendee won't know which droids are the right droids
- Builders won't know either!
- "These are the droids your looking for!"
- False positives "Move along, these are not the droids we're looking for"
- iBeacon range is much smaller, they have to get within 5m of the droid.
- 501st Droid Hunt (different droids, much more of them)

## Astromech Builders Hunt

- Find builders from [astromech.net](http://astromech.net) using R2FID
- Photo Images show up in hunt
- Changes twice a day
- Can include others
- Pocket battery powered iBeacon
- iBeacon proximity range reduced ~1m

## 501st Droid Hunt

- Find as many droids as possible
- Can include others, Rancho Obi Wan
- False positives “Move along, these are not the droids we’re looking for”
- iBeacon proximity “in range” reduced
- Includes MSE Droids, C3PO, etc.

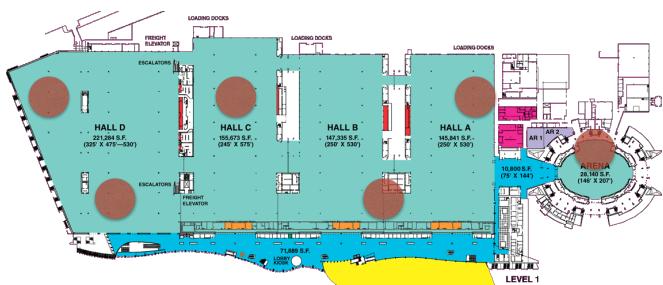
## R2FID Beacon TAG

- Battery powered wearable Beacon
- In pocket or on a lanyard
- Allows anyone to beacon
  - Actors
  - SW Universe Characters
  - Celebration Celebrities
  - LFL & Disney VIPs
  - Dave Everett
- A digital image of character for virtual trading card
- Beacon proximity range >5m
- 501st Legion is ON BOARD and ready



## Hero Droid Hunt

- Find specific Hero Droids
- Hero R2-D2 & Hero C3PO
- Proximity range 1m
- Toughest to Win, could change every 2 hours



What about Droid interactions?

## R2FID Reader



- ↳ DIY or Assembled
- ↳ Open Source HW & SW
- ↳ Place MB or R2FID tag near R2FID Logo
  - ↳ Droid Reader is behind the R2FID reader logo
  - ↳ Reads UUID & translates to an R2FID ID
  - ↳ Sends out i2c codes to the various i2c bus devices
  - ↳ Generate "Magical Moment"
- ↳ Droids will recognize UUID
- ↳ HERO/Rebel IDs
  - ↳ Characters will receive positive & fun responses
  - ↳ However 501st/Sith/Darth droid will react opposite
- ↳ SITH/Dark Side IDs
  - ↳ Dark, "scared" responses
  - ↳ Sith/Darth droids will react appropriately
- ↳ General IDs
  - ↳ Characters will receive general responses
  - ↳ Generic Interaction except for JAWAs... always bad for All Droids
- ↳ R2-KT ID
  - ↳ Hero R2s will react "romantic"
  - ↳ Wolf whistles, fun responses

## Disney's Magic Bands

- ↳ Estimated >1 Billion Dollar (US) in R&D, Installation
- ↳ Provides "Magical Moments" in theme parks
- ↳ 7 Byte UUID 0x04 0x27 0x5D 0xFA 0xA7 0x33 0x80
- ↳ Passive (13.56MHz) & Active (2.4Ghz)
- ↳ Battery Life Expectancy ~2 Years
- ↳ 52 Bytes of storage, but doesn't appear to be used
- ↳ 3-Apr: Disney started selling the MB for \$12.95 in the Parks



## R2FID SDK

### Software

- ↳ Nothing propagates, all done in reader firmware
- ↳ Recognizes 32 characters via Magic Band
- ↳ Recognizes 9,223,372,036,854,775,807 characters

### MiFare Classic Tag

- ↳ Allows for assignment of specific characters
- ↳ 4byte UUID in Classic Tag unused unless Trooper
- ↳ R2FID stored in ROM of the tag
- ↳ Easy to adapt, easy to use, easy to print

## Galactic IDs

- ↳ Specific Character R2FID "ID Card"
- ↳ Collectable
- ↳ LFL License?
- ↳ Vendor Sale?
- ↳ Need graphic work



## R2FID CON Kit

- CON Announcement Signage
- R2FID Reader/Station
- R2FID Beacons
  - 1 for Unique CON ID
  - 6 for Virtual Jawa Scavenger Hunt App
  - AC USB Power Supplies
  - Plug In, Download App, Play!
- Unique CON Branding of App
- Unique Gaming Possibilities
  - Unique CON App Key
  - In App purchases possible



## Supportive Infrastructure

- UUID Management & Assignment
- WebServers
- Applications
  - Front End Informational Editor (Droid,Builder, Club, etc...)
  - Administrative
- Registry Information Databases
  - MetaData Repository
  - Droid & Builder
  - National & Regional Club
  - Graphics
- SDK Customization Management
- Application Store Management
  - iOS & Google PLAY
  - Analytics



## R2FID Pricing

- R2FID Applications: Free
  - iTunes & Google PLAY
  - In App Purchases possible
- Beacon USB \$49.00 + 2 yrs
- Beacon TAG \$59.00 includes Battery + 2 yrs
- R2FID Reader (Droid)
  - DIY parts available ~\$80.00
  - R2FID Reader: TBD
- R2FID Reader Station
  - SW Universe Themed
  - CON Android App
- R2FID Infrastructure
  - Will support >100,000 active users simultaneous
  - >\$4k per year
  - 2 year commitment made



## R2FID Participation

- Clean “Character” image
- R2FID MetaData Form
- Apps will report “File Image”





Want to try it out?

## DroidCON Scavenger Hunt

In the vastness of the Hilton Garden Inn are virtual items that have been lost or forgotten over the years. You, as a scavenger, must find 6 items.

As you get close to an item you will receive notification and a badge will appear on your screen.

To Play: download Scavenger Hunt for R2FID  
Apple Devices: On iTunes App Store  
Android Devices: Google Store SOON

Launch the app  
Touch Start to begin the hunt!  
And may the Force be with you, always!