OVERVIEW AND FUTURE

SMARTDEVICELINK

Joey Grover, Livio
OVERVIEW

WHAT IS SMARTDEVICESLINK?

- SDL connects in-vehicle infotainment systems to smartphone applications
- A software library is placed on both the smartphone and the infotainment system
- SDL is and uses a common language to allow the two devices to talk to each other
SMARTDEVICELINK AND APPLINK

- AppLink was originally a proprietary API created by Ford.
- Ford announced they were contributing AppLink to the open-source under the name SmartDeviceLink in 2013. Purchased Livio the same year.
- Livio engineers are the project maintainers
- AppLink is now the branded version of SDL based off the open-source project
SMARTDEVICELINK AND OEM BRANDS

- FORD
- OEM 1
- OEM 2
- SDL
HOW IT WORKS TOGETHER

SMARTDEVICELINK AND OEM BRANDS

FD

OEM 1

OEM 2

SDL

Contributions
HOW IT WORKS TOGETHER

SMARTDEVICELINK AND OEM BRANDS

- FORD
- OEM 1
- OEM 2
- SDL
- FORD
- OEM 1
- OEM 2
- MYAPPS
- CONNECT LINK 9000

Contributions → SDL → Cloned → OEM 1 → Branded → MYAPPS

FORD → APPLINK

CONNECT LINK 9000 → OEM 2
HOW IT WORKS TOGETHER

SMARTDEVICESLINK AND APP PARTNERS

SDL
HOW IT WORKS TOGETHER

SMARTDEVICELINK AND APP PARTNERS

SDL ➔ PANDORA ➔ DOMINOS ➔ AWESOME APP

Implemented
HOW IT WORKS TOGETHER

SMARTDEVICELINK AND APP PARTNERS

SDL

PANDORA

APPLINK

DOMINOS

MYAPPS

AWESOME APP

CONNECT LINK 9000

Implemented

Works With
How it works together

SmartDeviceLink and App Partners

- SDL
- Pandora
- DOminos
- Awesome App
- MyApps
- Connect Link 9000
- APPLINK

Works With
Implemented
“MOTORISTS TAKE THEIR EYES OFF THE ROAD FOR ALMOST 18% OF THEIR TIME BEHIND THE WHEEL...”
WHY IS IT IMPORTANT

- Road trip to Las Vegas
- Taking 29 hours for 2,020 miles
- Over 5 hours or 363 miles eyes off the road
DRIVING ACROSS NEVADA BLINDFOLDED

322 miles
HOW IT WORKS TOGETHER

SDL USER EXPERIENCE
Change Source: Pandora

2:12
Howlin' For You
by: The Black Keys
2:12
Howlin' For You
by: The Black Keys

Pandora

Text Updates
Pandora

2:12
Howlin' For You
by: The Black Keys

Image Updates
Change Source: Pandora

2:12
Howlin' For You
by: The Black Keys

Pandora

Soft Buttons

Presets
Howlin' For You
by: The Black Keys
TEMPLATES DON’T HAVE TO BE STATIC

- Consider: a media application being used
- Corner Case: Artwork is not available
- Bad: Have an empty square where an image should be
- Option: Dynamic templates - accommodate what’s available
St. Vincent

Every Tear Disappears

St. Vincent

1:36 / 4:09
St. Vincent

Every Tear Disappears

St. Vincent
FUTURE

**GENERIC HMI**

- Livio’s take on a connect car user experience
- Example HMI for OEMs
- Media template available, more to come
- [https://github.com/smartdevicelink/generic_hmi](https://github.com/smartdevicelink/generic_hmi)
MULTIPLEXING BLUETOOTH FOR ANDROID

- Different Android devices have different channel limits
- Infotainment units may only have single channel
- Allow to communicate through a single RFCOMM channel
- Currently committed to develop branch
MULTIPLEXING BLUETOOTH FOR ANDROID

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1 ➔ RFCOMM CHANNEL 1

APP 2 ➔ RFCOMM CHANNEL 2

APP 3 ➔ RFCOMM CHANNEL 3

SDL ENABLED INFOTAINMENT
FUTURE

MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1

APP 2

APP 3

RFCOMM CHANNEL 1

RFCOMM CHANNEL 2

RFCOMM CHANNEL 3

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1 -> RFCOMM CHANNEL 1 -> SDL ENABLED INFOTAINMENT

APP 2 -> RFCOMM CHANNEL 2

APP 3 -> RFCOMM CHANNEL 3

APP 4 -> RFCOMM CHANNEL 4
MULTIPLEXING BLUETOOTH FORANDROID

APP 1 → RFCOMM CHANNEL 1
APP 2 → RFCOMM CHANNEL 2
APP 3 → RFCOMM CHANNEL 3
APP 4 → RFCOMM CHANNEL 4
APP 5 → NO CHANNEL AVAILABLE

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1
APP 2
APP 3

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1

APP 2

APP 3

ROUTER SERVICE

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1

APP 2

APP 3

SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1
APP 2
APP 3
APP 4

ROUTER SERVICE
RFCOMM CHANNEL 1
RFCOMM CHANNEL 2
SDL ENABLED INFOTAINMENT
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1  →  ROUTER SERVICE  ←  RFCOMM CHANNEL 1  →  SDL ENABLED INFOTAINMENT

APP 2  →  ROUTER SERVICE  ←  RFCOMM CHANNEL 1

APP 3  →  ROUTER SERVICE  ←  RFCOMM CHANNEL 1

APP 4

APP 5
MULTIPLEXING BLUETOOTH FOR ANDROID

APP 1 ➔ ROUTER SERVICE ➔ RFCOMM CHANNEL 1 ➔ SDL ENABLED INFOTAINMENT
APP 2 ➔ ROUTER SERVICE ➔ RFCOMM CHANNEL 1 ➔ SDL ENABLED INFOTAINMENT
APP 3 ➔ ROUTER SERVICE ➔ RFCOMM CHANNEL 1 ➔ SDL ENABLED INFOTAINMENT
APP 4 ➔ RFCOMM CHANNEL 2 ➔ SDL ENABLED INFOTAINMENT
APP 5 ➔ RFCOMM CHANNEL 2 ➔ SDL ENABLED INFOTAINMENT
**FUTURE**

**ENHANCED FRAMEWORKS FOR MOBILE**

- Android and iOS enhancement layer
- Much better automatic book keeping
- More developer friendly
- Some already merged into the iOS library
- Android library has pull request actively being worked on
FUTURE

SDL - REMOTE CONTROL

- Allow apps to control non-critical pieces of the car
- Climate control, radio, etc.
- Demonstrated at CES 2016
- Coming by the end of this year
FUTURE

REMOTE CONTROL

- RADIO APP
- INFOTAINMENT SYSTEM
- RADIO
- CLIMATE CONTROL
- SEATS
REMOTE CONTROL

FUTURE

RADIO APP

INFOTAINMENT SYSTEM

SmartDeviceLink

RADIO

CLIMATE CONTROL

SEATS
FUTURE

REMOTE CONTROL

RADIO APP

INFOTAINMENT SYSTEM

RADIO

CLIMATE CONTROL

SEATS

SmartDeviceLink
REMOTE CONTROL

FUTURE

RADIO APP
Driver

CLIMATE
Passenger

INFOTAINMENT SYSTEM

PERMISSION?

RADIO

CLIMATE CONTROL

SEATS

CLIMATE
Passenger
DEVELOPER PORTAL

- smartdevicelink.com
- Centralized location for all resources related to SDL
- Global search
- All documentation is open-sourced
- Next phase includes easier access to a Core instance, SHAID integration, etc.
GitHub

- github.com/smartdevicelink
- Version control repository for open source and private projects
- Libraries and examples exist on the SmartDeviceLink team page
- Follows gitflow process
- Anyone can contribute after signing a Contributor's License Agreement (CLA)
Similar to the Swift open source process

https://github.com/smartdevicelink/sdl_evolution
Similar to the Swift open source process
Determine features through community and stakeholders
Similar to the Swift open source process

Determine features through community and stakeholders

Anyone can create proposals
SDL EVOLUTION

PROCESS

PROPOSAL
SDL EVOLUTION

PROCESS

Submit for Review

PROPOSAL → STEERING COMMITTEE
**SDL EVOLUTION**

**PROCESS**

1. **PROPOSAL** → **STEERING COMMITTEE**: Submit for Review
2. **STEERING COMMITTEE** → **OPEN SOURCE COMMUNITY**: Accepted for Review
3. **OPEN SOURCE COMMUNITY** → **STEERING COMMITTEE**: Reviewed for a week

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**OPEN SOURCE COMMUNITY**

Reviewed for a week

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**STEERING COMMITTEE**

Accepted for Review

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**PROPOSAL**

Submit for Review
SDL EVOLUTION

PROCESS

Submit for Review

STEERING COMMITTEE

Accepted for Review

OPEN SOURCE COMMUNITY

Reviewed for a week

STEERING COMMITTEE

All feedback taken and choice made

ACCEPTED FEATURE

ACCEPTED WITH CHANGES

REJECTED

PROPOSAL

All feedback taken and choice made

ACCEPTED WITH CHANGES

REJECTED
SLACK

- SmartDeviceLink slack team (slack.smartdevicelink.com)
- Real time help and answers
- Developers and other members of the community
- Join the #Hackathon channel!
QUESTIONS?

Thank you
Joey Grover, CTO