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ZEBRA DEVELOPER PORTAL

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Upcoming Dev Events

October 2020 - Zebra DevTalk Community Day -

One day event series of technical topics from our Zebra Dev Rel Team experts

June 2021 - Zebra DevCon –

Live event (location to be confirmed)

DevTalk – Latest features in DataWedge 8.x

**Darryn Campbell /
Cathy Wei**

SW Engineers, Zebra Technologies

19th August 2020

Latest Features in DataWedge 8.x

Agenda

- DataWedge Overview & Introduction
 - What's New
- Next Generation SimulScan
 - MultiBarcode (Overview & Demo)
 - Document Capture
- New & enhanced plugins
 - RFID (added DW 7.3, enhanced since)
 - Voice Input (PTT from DW7.4 [N+ GMS]) (Overview & Demo)
- Security
 - DataWedge Manager CSP
 - Intent Component (Overview & Demo)
 - Secure access to Intent API
 - Content Provider
- Other enhancements:
 - New decoder support
 - GS1 DataMatrix
 - GS1 QRCode
 - DotCode
 - Grid Matrix
 - Febraban (I2of5)
 - Signature
 - OCR
 - Connection / disconnect auto switch
 - KeyStroke 'send Characters as Events'
 - Auto import: no need to use a temporary file when copying a database file (7.6)
 - Enterprise Keyboard integration

Latest Features in DataWedge 8.x

Overview / Introduction




- What is DataWedge?
 - Methods to capture data:
 - Zero-code - use DataWedge UI with Keystroke output
 - Programmatically:
 - Minimal code – basic Android intent
 - DataWedge APIs:
- <https://techdocs.zebra.com/datawedge/latest/guide/api/>

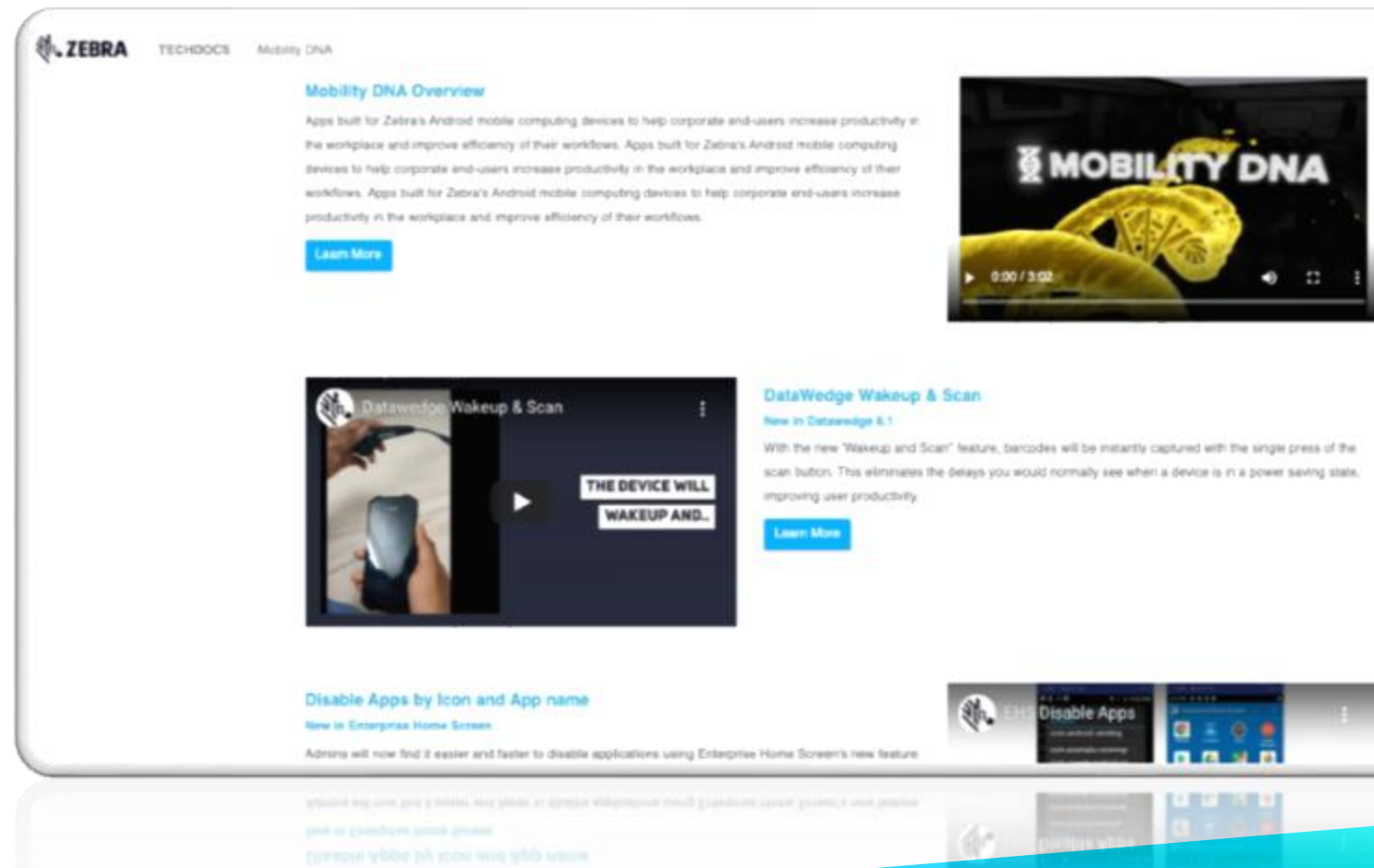


Latest Features in DataWedge 8.x

Overview / Introduction

- Part of Zebra's Mobility DNA (MDNA) 
- **Business Tools:** Workforce Connect, SmartDex, ...
- **Productivity tools:** DataWedge, Enterprise Keyboard, Enterprise Home Screen, Device Diagnostics, ...
- **Management tools:** StageNow, Device Tracker, PowerPrecision Console, ...
- **Development tools:** Enterprise Browser, Enterprise Mobility Development Tool Kit, Mobility Extensions, MX, ...
- See the latest Mobility DNA features:

<https://techdocs.zebra.com/mdna/>



Latest Features in DataWedge 8.x

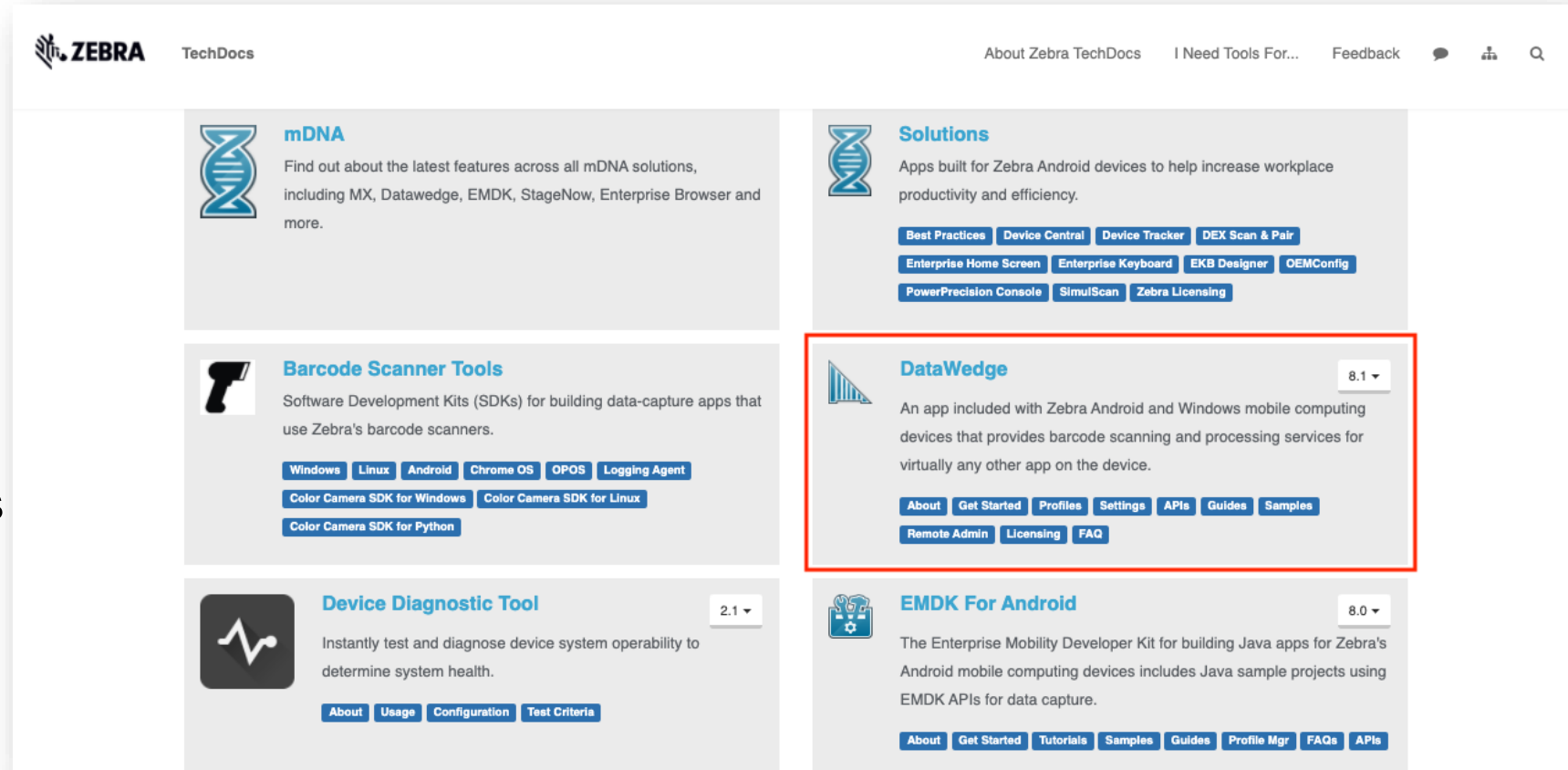
Resources

- TechDocs – <https://techdocs.zebra.com/>. New sections:

- Get Started – includes Best Practices
- Profiles
- Guides
- Licensing
- Remote Admin
- Sample apps – includes tutorial
- FAQ

- Darryn Campbell's blogs:

https://darryncampbell.co.uk/technology_index.html

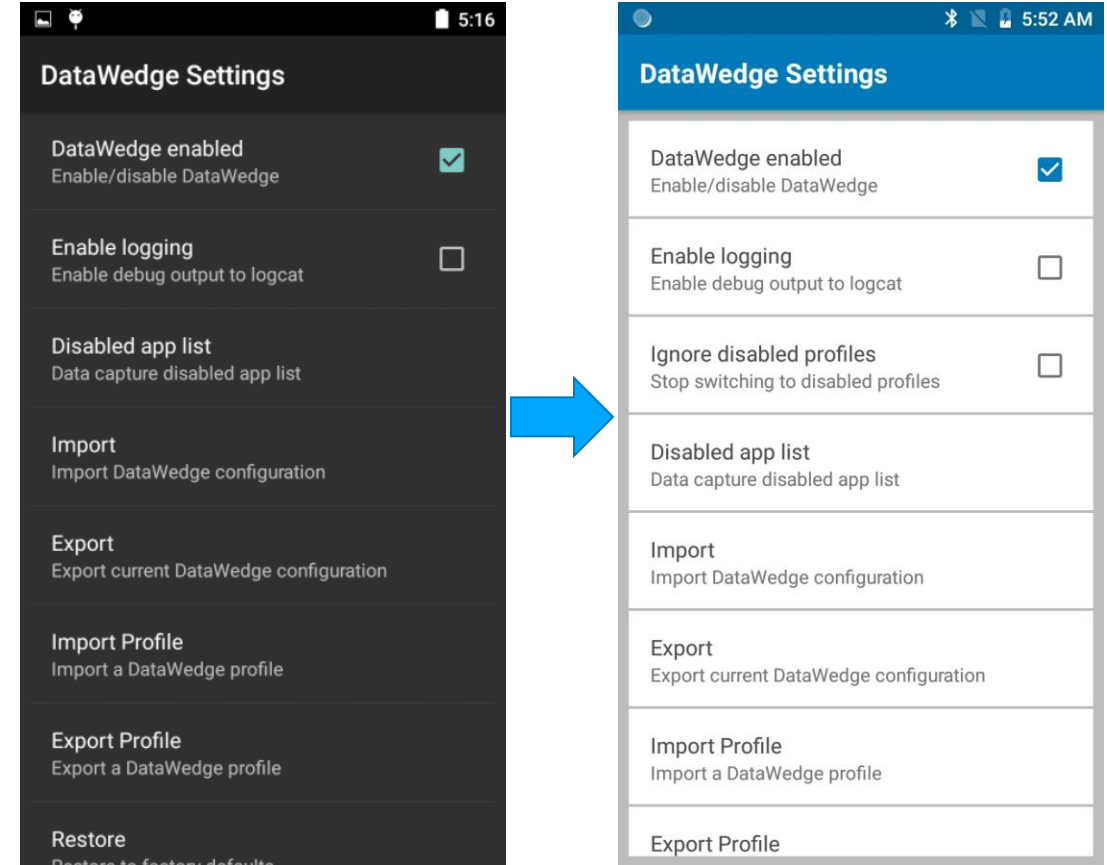


Latest Features in DataWedge 8.x

What's New Prior to DataWedge 8.0

New major features introduced:

- New UI – v7.6
- Secure remote administration using CSP for mass configuration deployment – v7.5
- New voice commands to navigate within the foreground app and issue specific key presses – v7.5
- Support for Android Oreo (8.0) or later - v7.5
- Enterprise Keyboard Configuration – v7.4
- Voice capture activation with PTT for Voice Input – v7.4
- New Decoder Signature - v7.3
- New RFID Input plugin to read RFID tags – v7.3.22

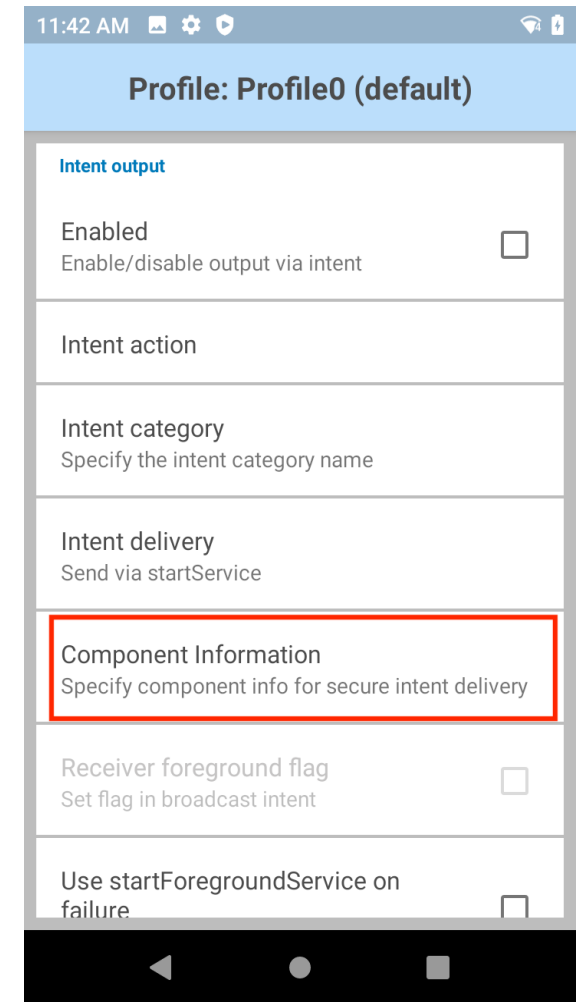
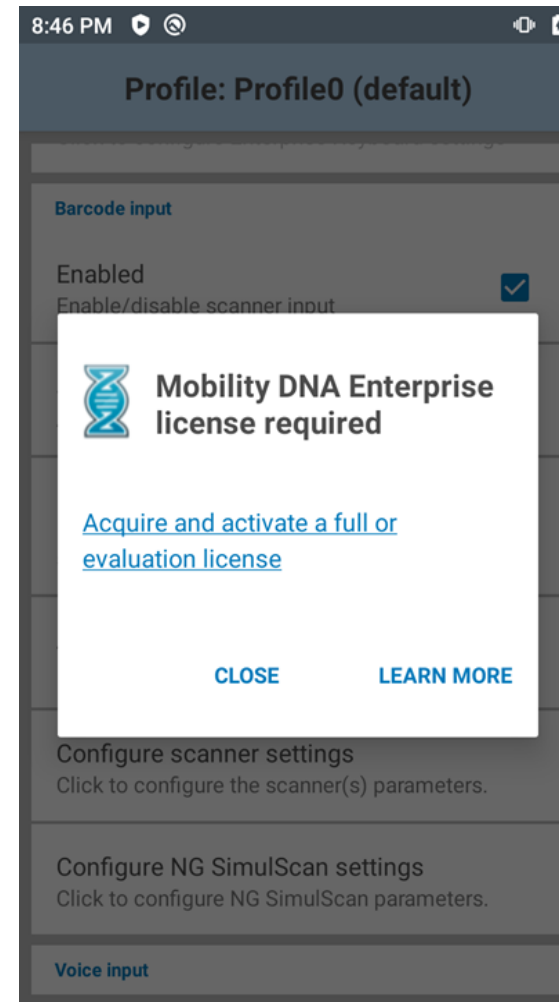


Latest Features in DataWedge 8.x

What's New in DataWedge 8.0

New major features in 8.0:

- New NextGen SimulScan Configuration – licensing required on Professional-series devices
 - Multibarcodes
 - Document Capture
- Secure Intent Output – Component Information
- Content Provider for Intent Output to scan large data, such as images
 - See **Content Provider** programmer's guide
- Import NextGen SimulScan Templates for document capture

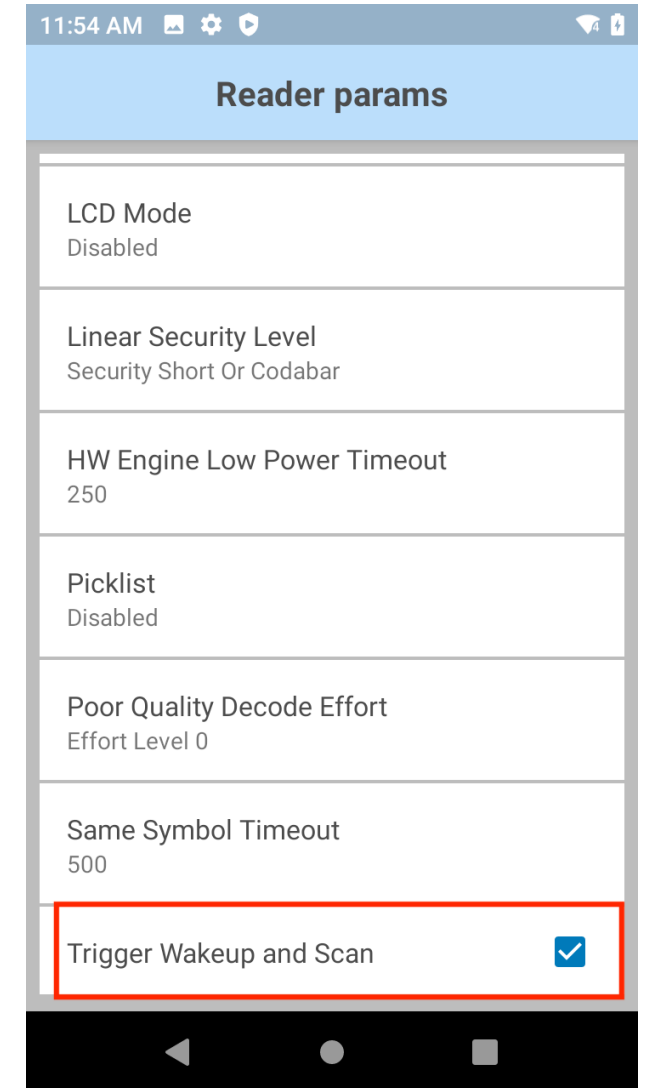


Latest Features in DataWedge 8.x

What's New in DataWedge 8.1

New major features in 8.1:

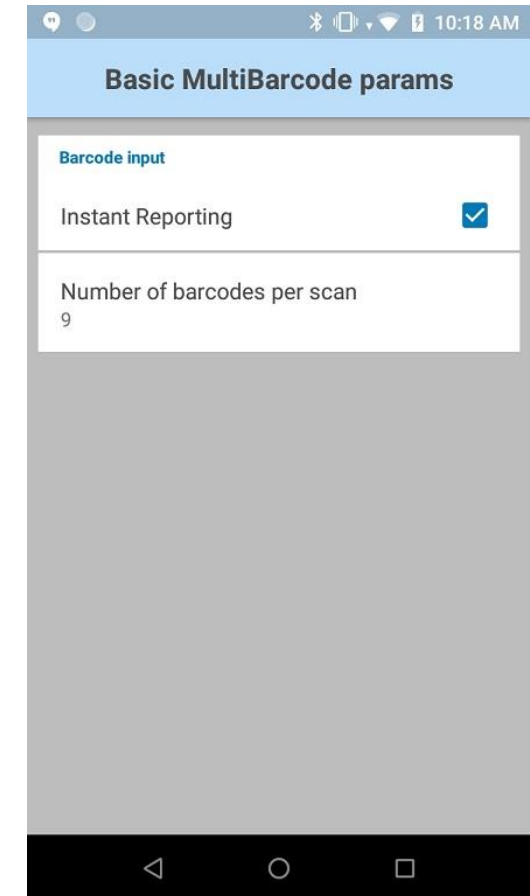
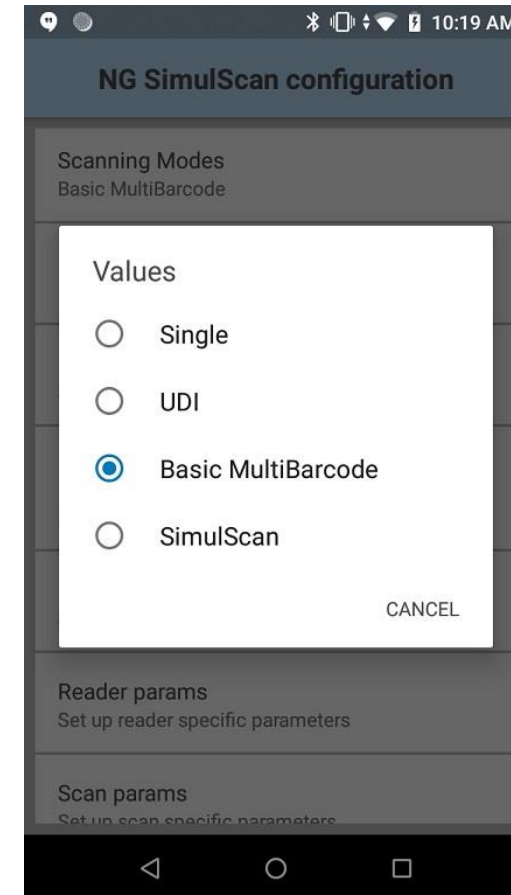
- Secure access to DataWedge intent APIs
 - See programmer's guide: <https://techdocs.zebra.com/datawedge/latest/guide/programmers-guides/secure-intent-apis/>
- Trigger Wake Up and Scan in Reader Parameters



Latest Features in DataWedge 8.x

Next Generation SimulScan

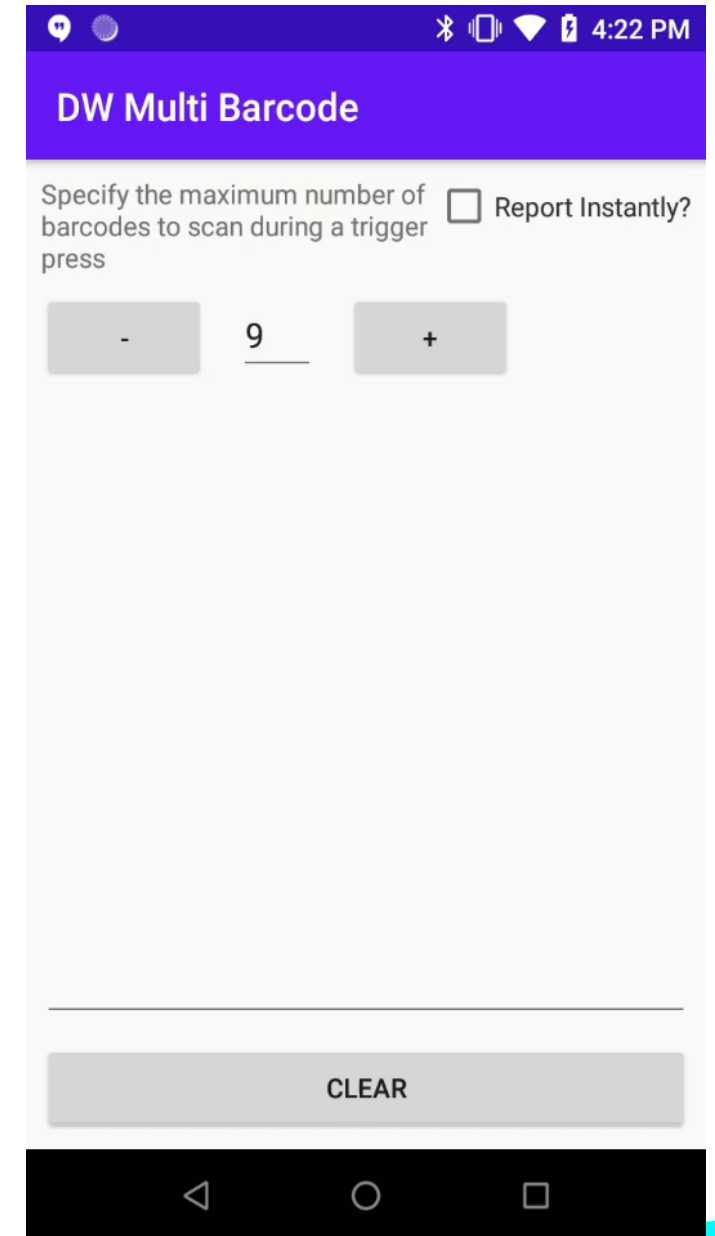
- Basic MultiBarcode
 - Enables you to scan up to 100 barcodes in a single trigger pull
 - Either:
 - Specify the number of barcodes you expect to scan per trigger (*Number of barcodes per scan*)
 - Choose to receive an unspecified number of barcodes in a single trigger pull (*Report Decoded Barcodes*)
 - Choose to immediately receive any barcode scanned (*Instant Reporting*)
 - Notes & Caveats are available on [TechDocs](#)
 - Max payload: 2KB
 - Instant Reporting takes precedence over Continuous read & 'Number of barcodes per scan)
 - Report data via KeyStrokes (with separator) or Intent



Latest Features in DataWedge 8.x

Next Generation SimulScan

- Sample:
 - <https://github.com/darryncampbell/DataWedge-MultiBarcode-Sample>
 - <https://developer.zebra.com/blog/scanning-multiple-barcodes-single-trigger-pull>



Latest Features in DataWedge 8.x

Next Generation SimulScan

- [Document Capture](#)
 - Generate a custom template with an anchor barcode
 - Import the template into DataWedge using DataWedgeMgr CSP
 - Use new **Content Provider** in Intent Output to retrieve scanned data from files larger than 500 KB , e.g. images.
 - Scan the anchor barcode to capture designated areas within the template as images, e.g. address field, signatures, etc.

DataWedge
Anchor Barcode Template

Address

ZEBRA TECHNOLOGIES
1 Zebra Plaza
Holtsville, NY 11742

Signature

John Doe


Anchor-Barcode-Demo

3:26 PM

NG SimulScan configuration

Select scanner to set parameters
2D Barcode Imager

Scanning Modes
SimulScan

Document Capture Template
None

Basic MultiBarcode params
Setup Basic MultiBarcode specific params

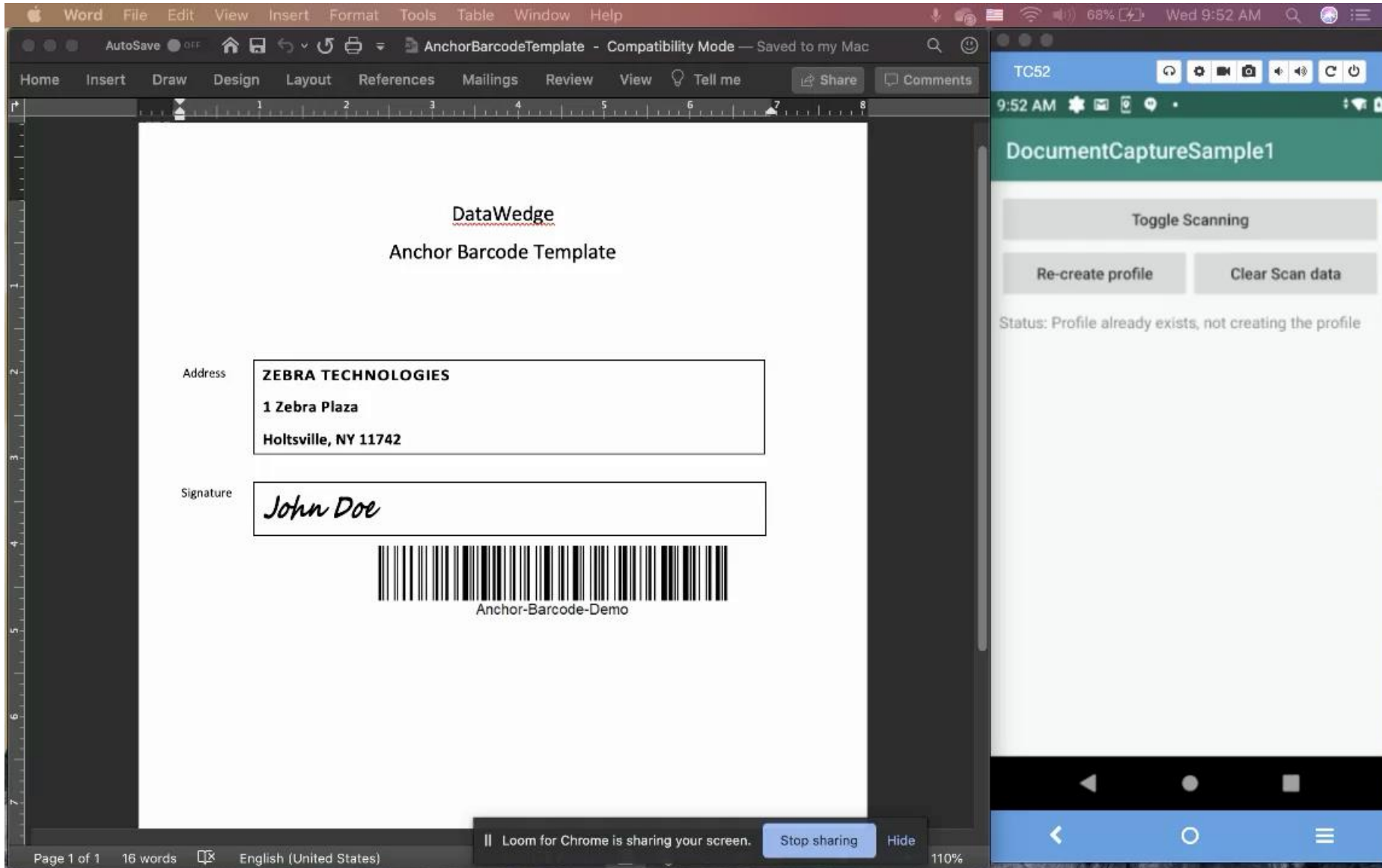
Decoders
Enable/disable decoders and configure decoder specific parameters

UPC/EAN params
Set up generic UPC/EAN parameters

Reader params
Set up reader specific parameters

Latest Features in DataWedge 8.x

Next Generation SimulScan



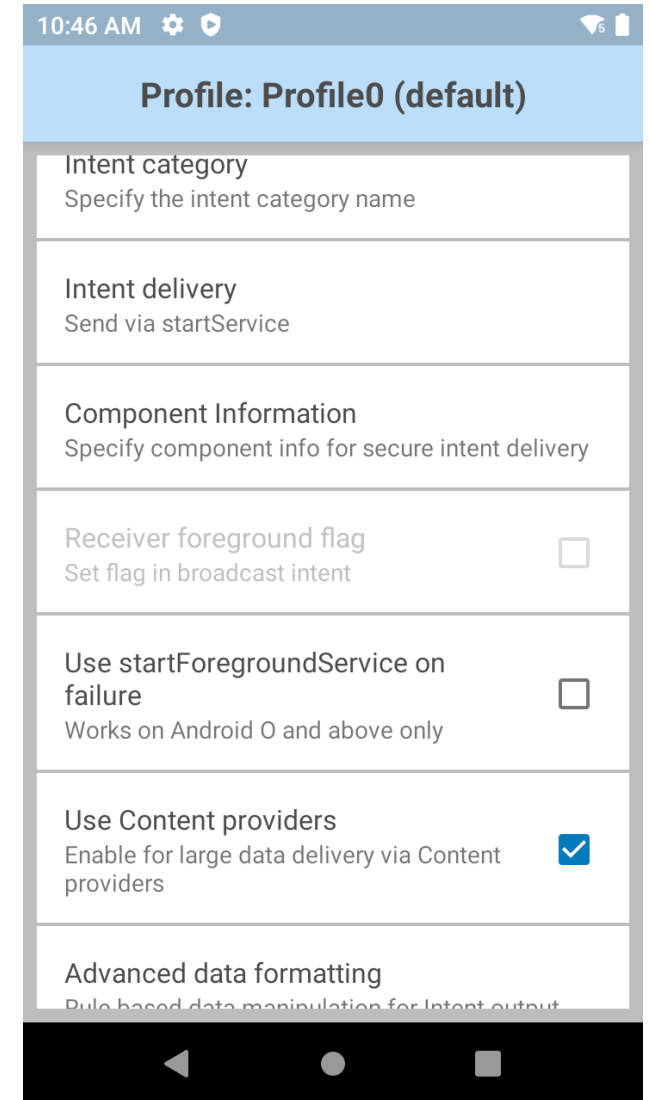
- [Demo: Document Capture Sample](#)
 - Capture address and signature fields from a sample template.

Latest Features in DataWedge 8.x

Enhanced Security

- [Content Provider](#)

- Retrieve scanned data from files larger than 500 KB, such as images, particularly with Document Capture and Decoder Signature
- Enable setting **Use Content Providers** in DataWedge under **Intent Output** section
- Process intent output with content provider:
 - Only 768 KB of data can be sent at one time through Android's ContentProvider Cursor object. If data exceeds this limit, remaining data is sent in subsequent data packets.
 - App receives the ContentProvider object in separate parts - concatenate the data received to reconstruct the full data object
- See **Content Provider** programmer's guide:
<https://techdocs.zebra.com/datawedge/latest/guide/programmers-guides/content-provider/>



Latest Features in DataWedge 8.x

New Decoder support: Signature

- [Signature Decoder](#)
 - [Sample app](#) is available as well as an [overview PDF for creating them](#)
 - Scan the barcode (Figure 1) and capture the image between the vertical bars
 - Image is returned to the calling app in requested format (See Table 2)
- This decoder is not new but *is* considered part of NG SimulScan for Image Capture
- More image capture options are available as part of NG SimulScan:
 - [Image capture using Anchor Barcode](#) | Whole page image capture (coming later)

Figure 1 – Decoder Signature Sample



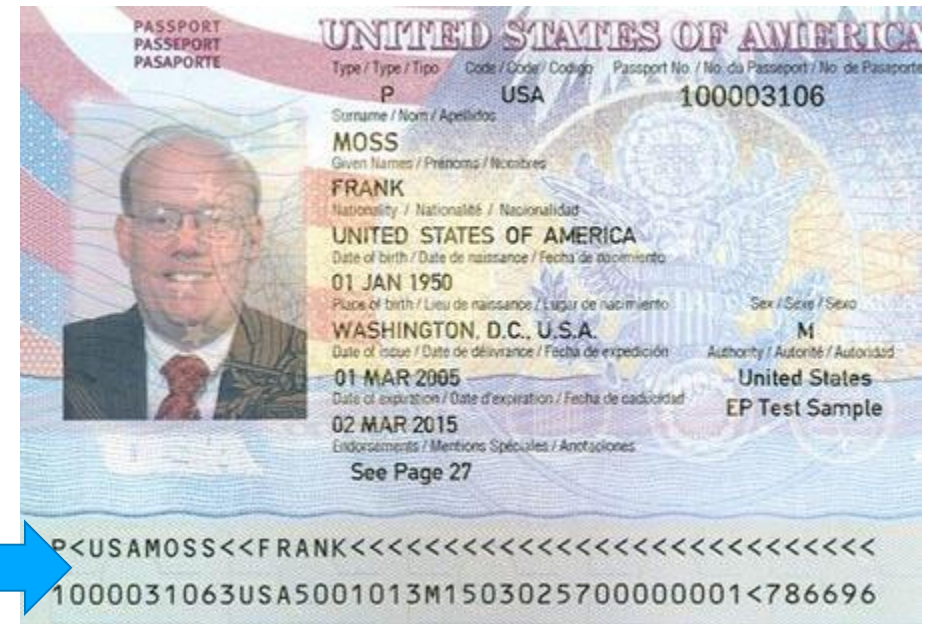
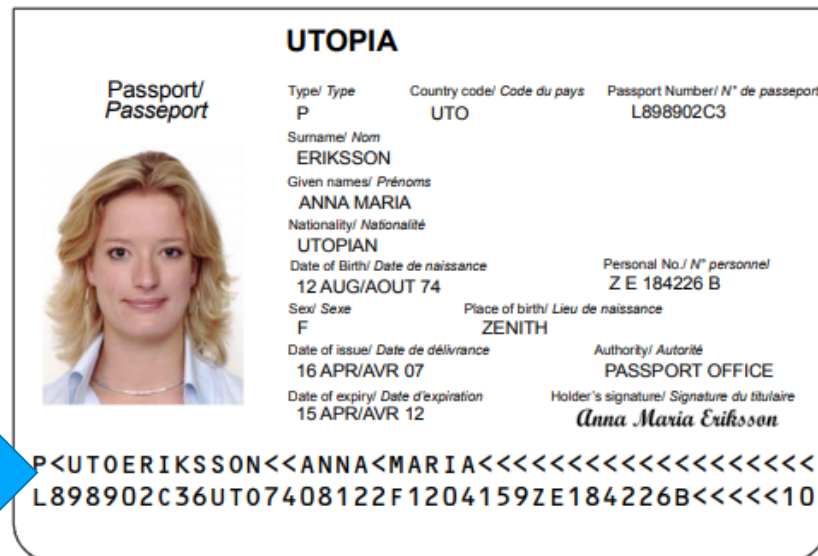
Table 2 – User Defined Decoder Signature Parameters

Parameter	Defined
Width	Number of pixels
Height	Number of pixels
Format	JPEG, BMP, TIFF
JPEG quality	A value between 1 and 100
Bits Per Pixel (not applicable to JPEG format)	1 (2 levels)
	4 (64 levels)
	8 (256 levels)

New Decoder support: OCR

OCR

- Ability to scan and recognize text displayed with the [OCR-A](#) or [OCR-B](#) fonts
- Tell DW the type of data you are scanning for more accurate results (Full ASCII, Travel document, e.t.c)
- Used in a variety of applications including:
 - Machine readable travel documents (Passports, Visas)



Latest Features in DataWedge 8.x

New Decoder support

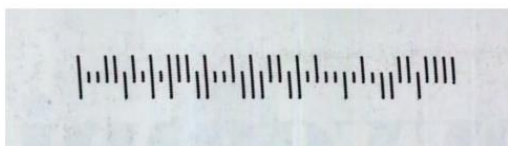
- Zebra scanners already support hundreds of symbologies & symbology parameters

- Newest to be added:

Encoding GS1 in a DataMatrix of QRCode



Finish Postal 4S



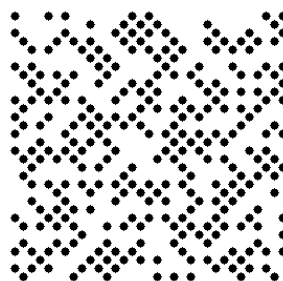
Febraban digit on I2of5



Grid Matrix



DotCode



Digimarc Barcode



Looks like this

Digimarc



Performs like this

DPM



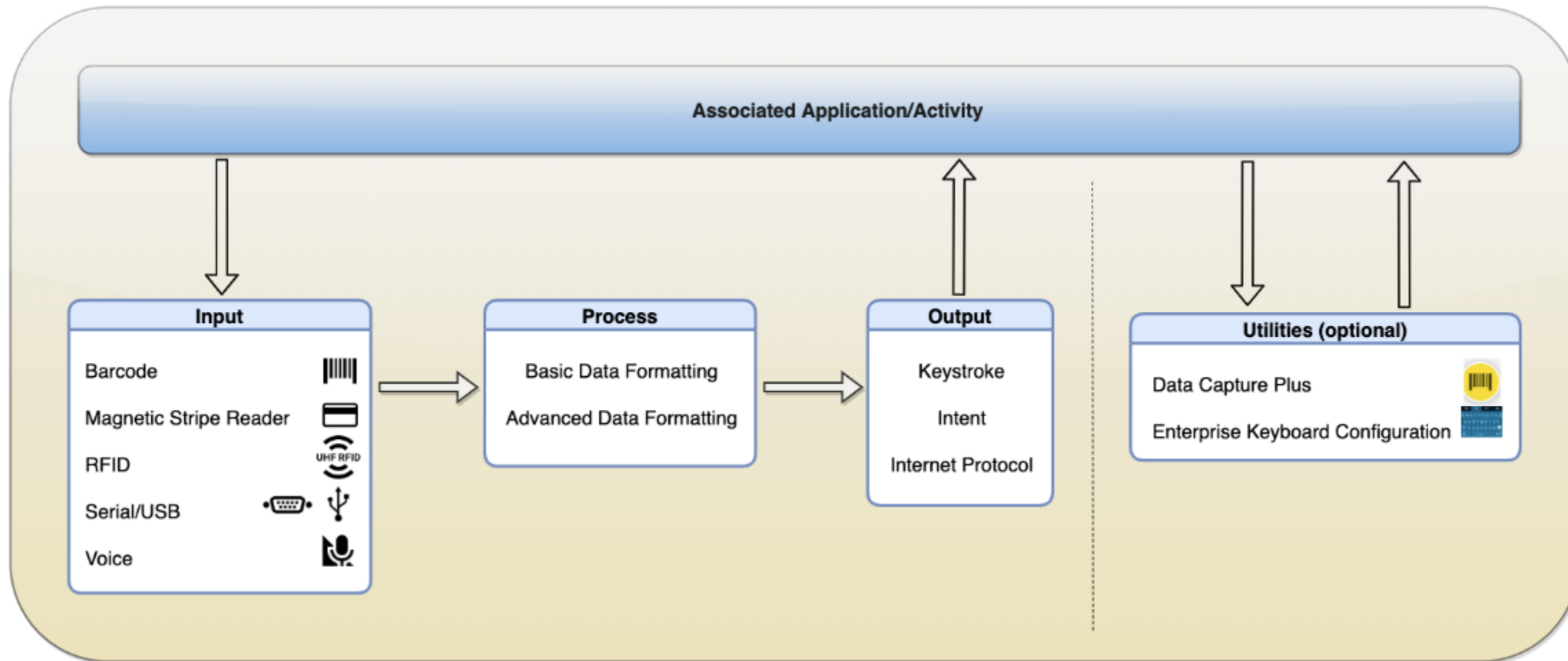
Dutch Postal 3S



Latest Features in DataWedge 8.x

New & Enhanced Plugins

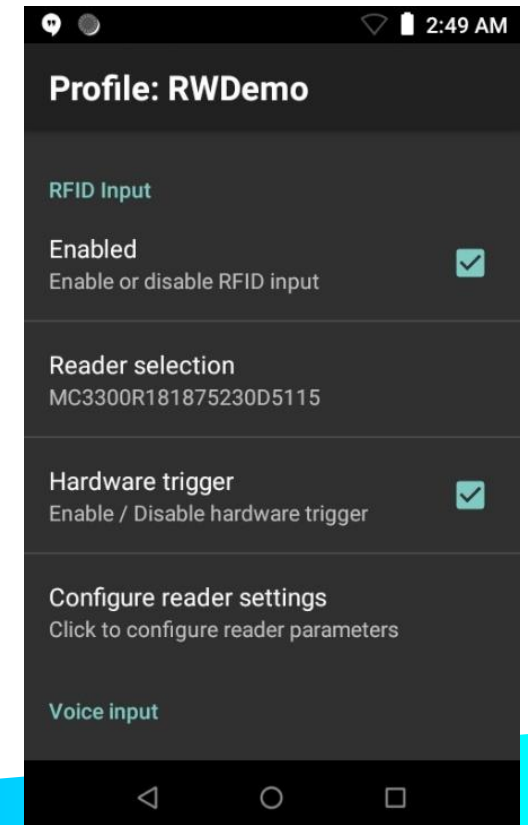
 DataWedge Profile



Latest Features in DataWedge 8.x

New & Enhanced Plugins: RFID

- TechDocs guide: <https://techdocs.zebra.com/datawedge/latest/guide/input/rfid/>
- Introduced in DataWedge 7.3, enhanced in DataWedge 7.5 & 8.0
- Only (currently) supports MC3300R
- Pre 8.0: Manual step required to map the hardware trigger to RFID
 - It is currently mapped to the barcode scanner
- Full capability to modify read duration, transmit power, inventory state, memory bank, trigger mode, dynamic power (7.5+), pre/post-filters (7.5+)
- Receive data via keystroke or Intent



Latest Features in DataWedge 8.x

New & Enhanced Plugins: Voice Input

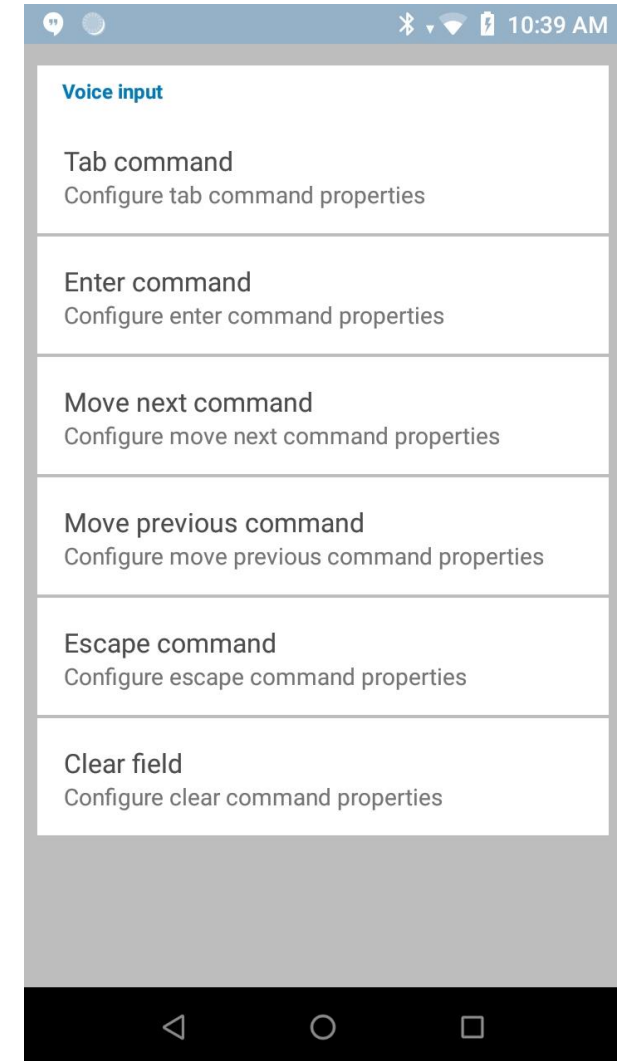
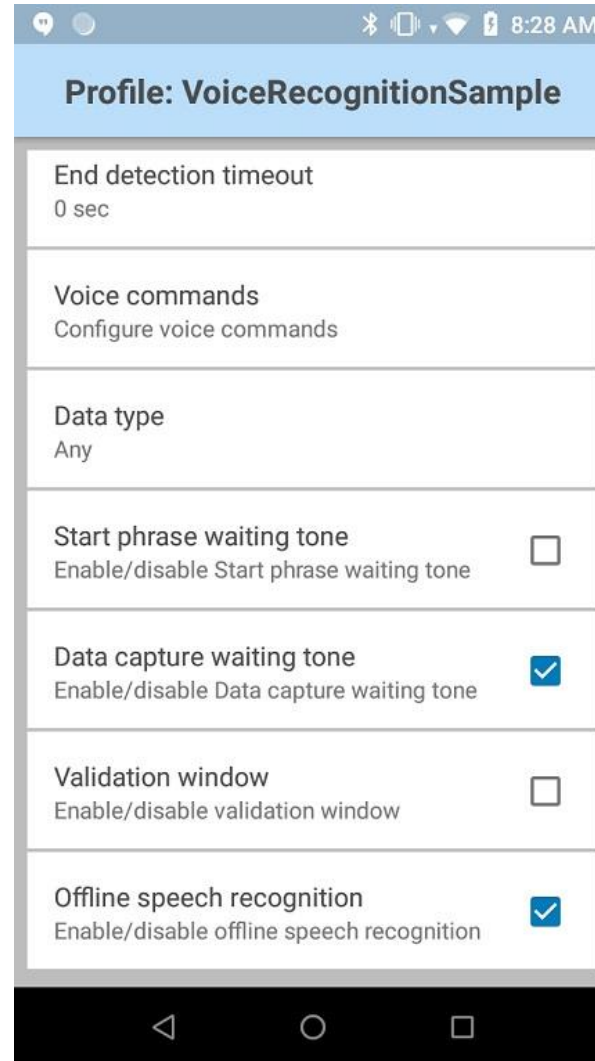
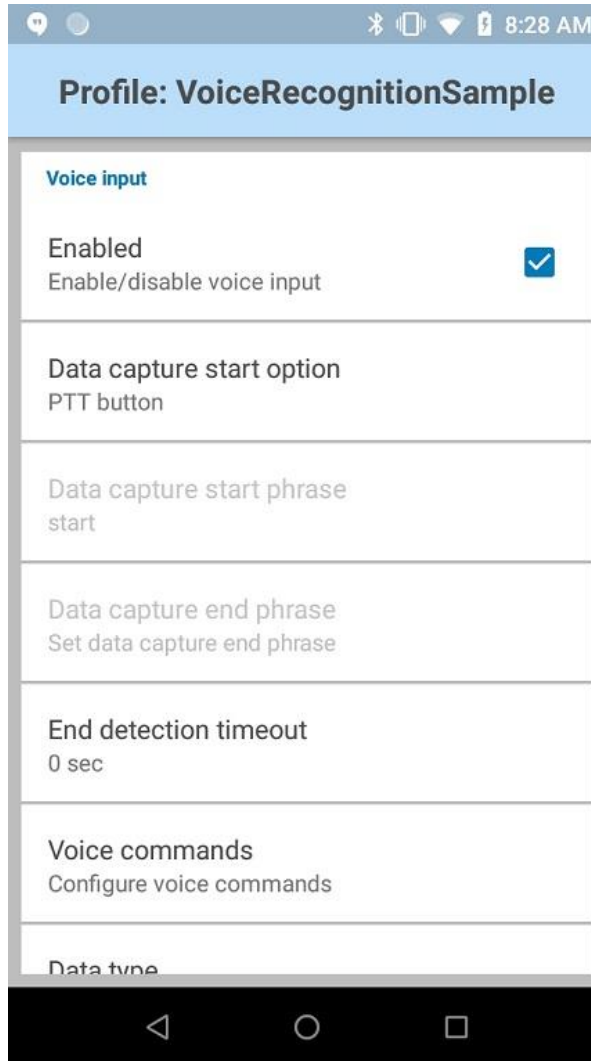
- Not a new plugin – introduced back in 2018 as a beta trial
- Enhanced since its introduction to make it more usable and ‘production ready’
- Enhanced in DataWedge 7.4 to support the PTT key
- Enhanced in DataWedge 7.5 to support commands, all text is customizable:
 - TAB (next field)
 - ENTER (submit form)
 - MOVE NEXT (activity element)
 - MOVE PREVIOUS (activity element)
 - ESCAPE (exit screen or return to previous)
 - CLEAR (the current field)
- Previous DevTalk did a deep dive on Voice Input back when it was first introduced:
 - https://youtu.be/Hp_Z24WSrUg



Latest Features in DataWedge 8.x

New & Enhanced Plugins

- Voice Input
- DW UI

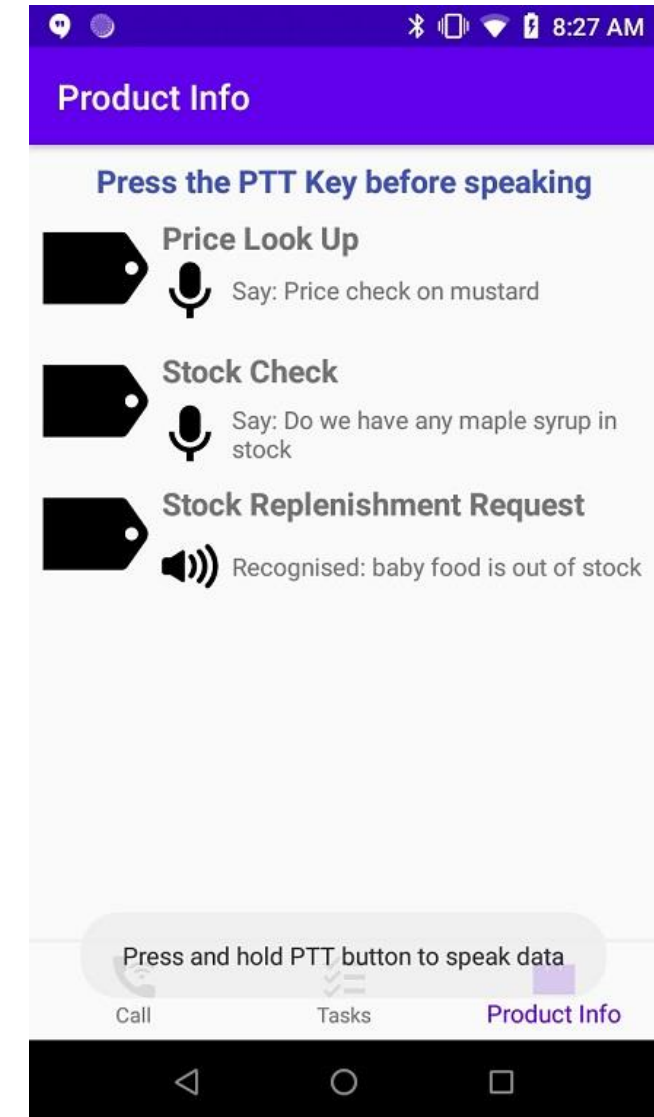
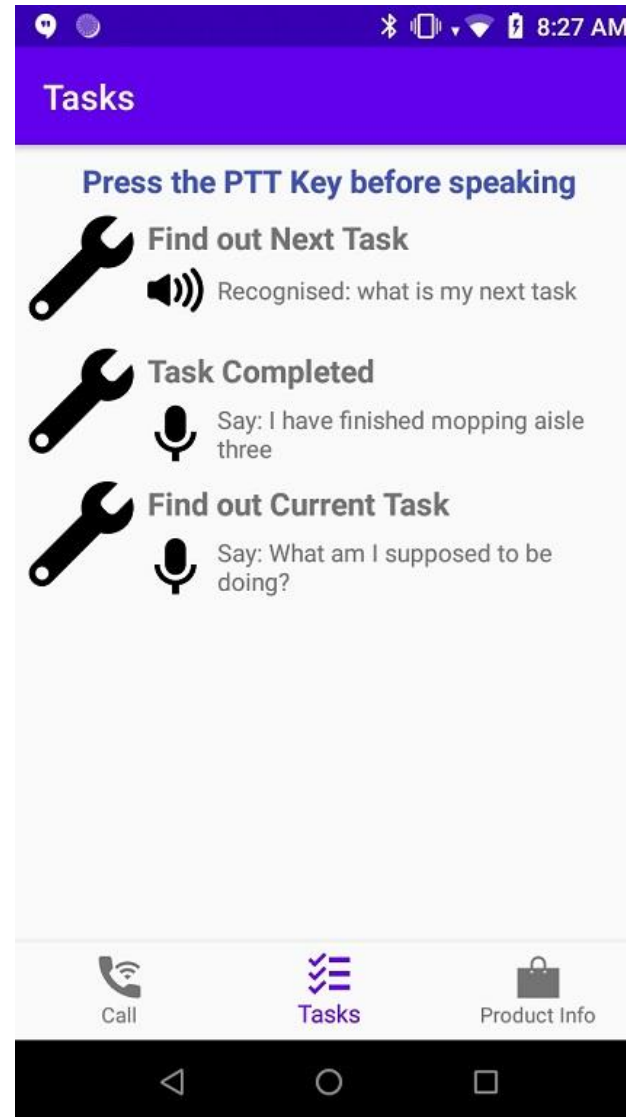


Latest Features in DataWedge 8.x

New & Enhanced Plugins

Voice Input:

- Example sample app:
<https://github.com/darryncampbell/DataWedge-VoiceRecognition-Sample>
- Uses Voice Input Plugin & simple Levenshtein distance algorithm to determine what the operator said.
- Initiated by pressing the PTT key
- Application can then take action on the voice command (deliver a task, call an associate, perform a price lookup)



Latest Features in DataWedge 8.x

Enhanced Security – DataWedge Manager CSP

- Supported in DataWedge 7.6 or higher
- Requires MX9.2 or higher on the device
- Use case: Prevent one (potentially rogue) app from interfering with the functionality of other apps
- Allows a device administrator to control what DataWedge can do:
 - Disable DataWedge UI
 - Disable Auto-import of DataWedge settings or Profile settings from mass storage
 - Disable Import via Intent
 - Enable Import of only a specific configuration file (DataWedge settings or individual Profile settings)
 - Add a “Next Gen SimulScan” Template

The screenshot shows the 'DataWedgeMgr' configuration screen. At the top, there's a header with 'SN DataWedgeMgr' and a description: 'DataWedge management service'. Below this is a 'Create New Setting' button. A checkbox labeled 'Save Setting for Re-use' is present. The 'DataWedge configuration file:' field contains the path '/device/settings/datawedge/autoimport/datawedge.db'. The 'Automatic configuration import:' section has three buttons: 'Do not change', 'Turn On', and 'Turn Off'. The 'Manual configuration:' section has three buttons: 'Do not change', 'Enable', and 'Disable'. The 'Import via Intent API:' section has three buttons: 'Do not change', 'Enable', and 'Disable'.

SN DataWedgeMgr

Description: DataWedge management service

Create New Setting

☐ Save Setting for Re-use

DataWedge configuration file: `/device/settings/datawedge/autoimport/datawedge.db`

Automatic configuration import:

Do not change Turn On Turn Off

Manual configuration:

Do not change Enable Disable

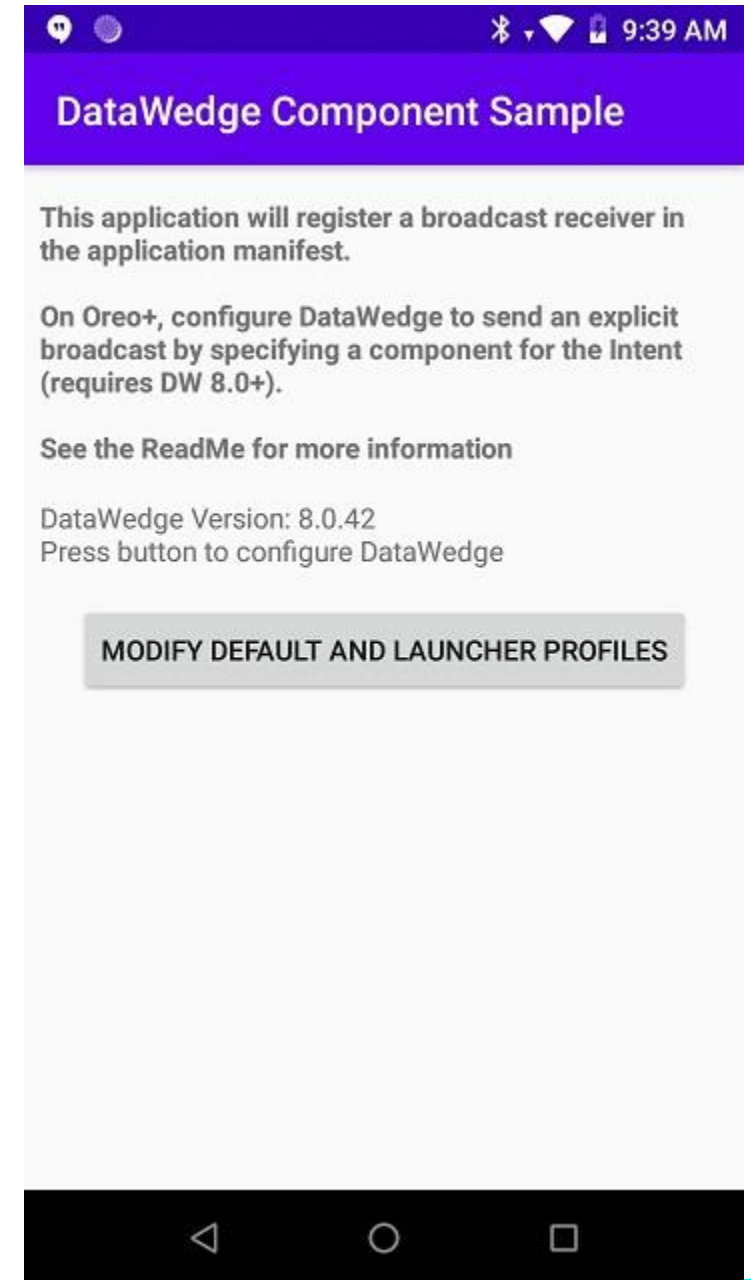
Import via Intent API:

Do not change Enable Disable

Latest Features in DataWedge 8.x

Enhanced Security – Explicit Intents

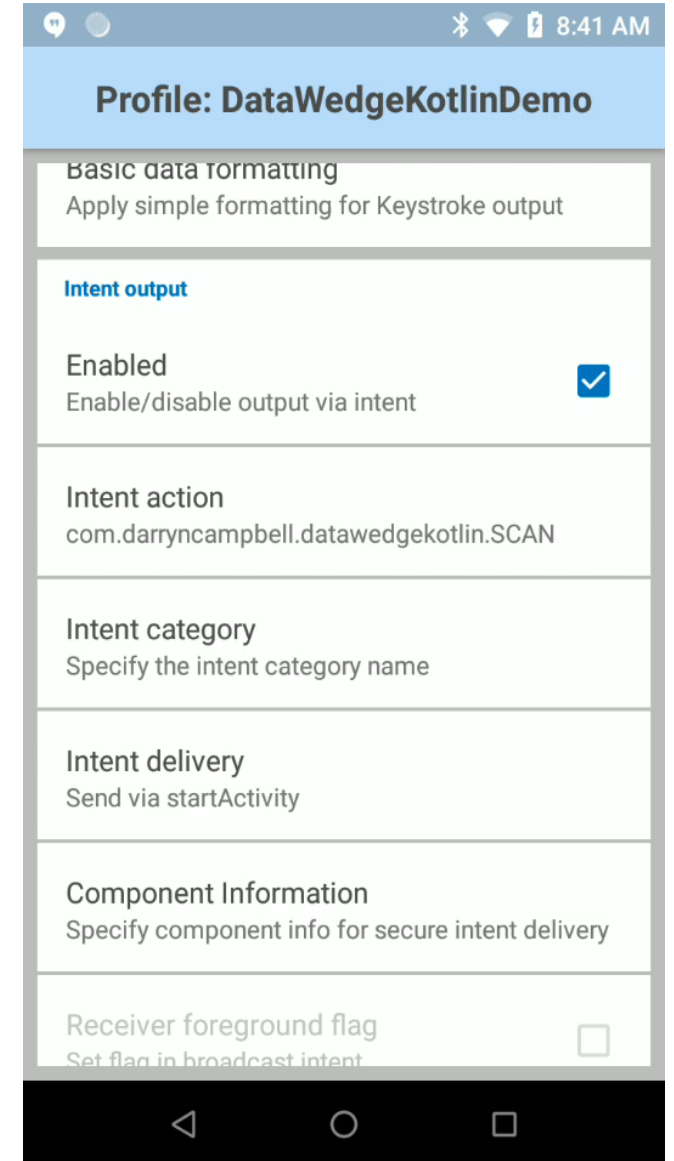
- Set the Android Component of the Intent that DataWedge sends
- Means DataWedge is now capable of sending explicit Intents which will ONLY be received by the destination package.
- Additional security is provided by supplying the signature of the destination application ([More information about signatures](#))
 - Absolute certainty that the application receiving the SCAN intent is the application you intend to receive it
- Does not apply to DataWedge API return values – only the SCAN intent.
- Use cases include enhanced security and receiving broadcast intents registered in the Android manifest
 - <https://github.com/darryncampbell/DataWedge-Component-Sample>



Latest Features in DataWedge 8.x

Enhanced Security – Explicit Intents

- More information available on [TechDocs](#)
- Setting the Intent Component through the DataWedge UI
 - Specifying multiple components will cause DataWedge to send multiple Intents
 - Using the UI will automatically generate the signature of the target application for you. This may be easier than generating it yourself in some situations.
- Can also specify the component via the [SET_CONFIG](#) API
 - Would need to generate the optional signature of the target app(s) yourself in this case
- Supports StartActivity, StartService and SendBroadcast



Latest Features in DataWedge 8.x

Enhanced Security – Secure Access to Intent API

- Currently: ANY application can call and modify DataWedge
- Nefarious or clumsy apps could, in theory:
 - Modify another app's DataWedge profile
 - Disable DataWedge or overwrite the DataWedge configuration
 - Retrieve information about DataWedge or your app's DataWedge profile

Category	Intent API
Configuration	Get Config, Get Disabled App List, Get Ignore Disabled Profiles, Get Profile List, Clone Profile, Create Profile, Delete Profile, Rename Profile, Set Ignore Disabled Profiles, Set Disabled App list, Restore Config, Import Config
Notification	Profile Switching (from Register/Unregister for Notification), Scanner Status (from Register/Unregister for Notification) Configuration Change (from Register/Unregister for Notification)
Query	Enumerate Scanners, Get Active Profile, Get DataWedge Status, Get Version Info, Get Scanner Status, Get Profiles List, Get Ignore Disabled Profiles
Runtime	Enable/Disable DataWedge, Enable/Disable Scanner Input Plug-in, Switch Scanner Params, Switch SimulScan Params, Soft Scan Trigger, Soft RFID Trigger, Switch to Profile, Set Default Profile, Reset Default Profile, Switch Scanner, Set Reporting Options

Latest Features in DataWedge 8.x

Enhanced Security – Secure Access to Intent API

- Follow the guide at <https://techdocs.zebra.com/datawedge/latest/guide/programmers-guides/secure-intent-apis/>
- Also refer to the DataWedge Manager CSP: <https://techdocs.zebra.com/mx/datawedgemgr/>
- Four steps:
 1. Whitelist your application to call the com.symbol.datawedge.api service (AccessManager) – Need to provide the package signature
 2. Select the API category you want to restrict, by default, none are restricted (DataWedge Mgr)
 3. Acquire a Token via the EMDK Profile Manager API (AccessManager)
 4. Include the TOKEN as an Extra when invoking the DataWedge Intent API

Requires:

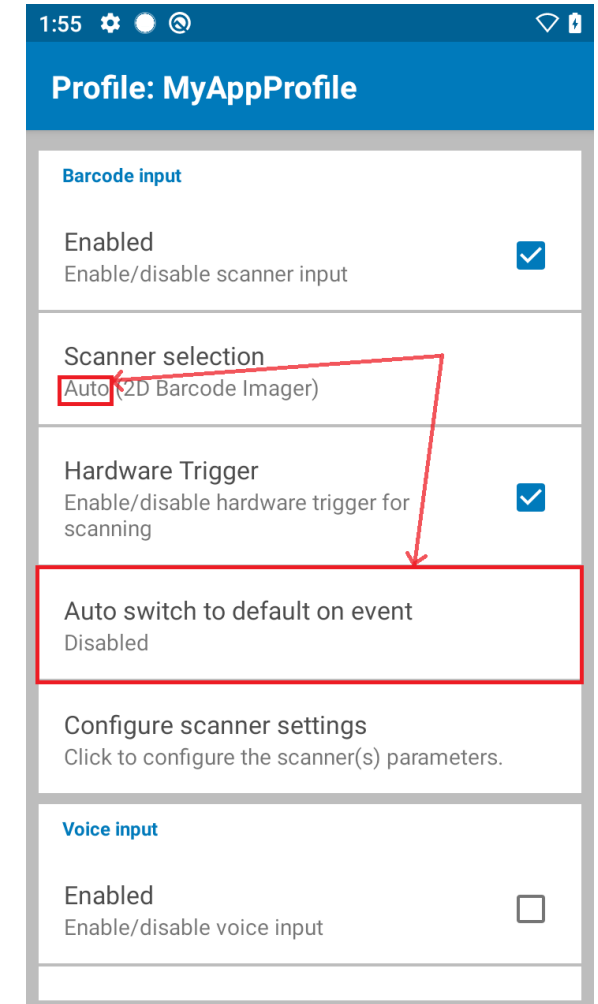
- MX version 10.1.1 or higher
- DataWedge version 8.1 or higher

Latest Features in DataWedge 8.x

Other Enhancements: Bluetooth Connection / Disconnection auto switch

Connection / disconnect auto switch

- **Disabled** - No scanner switching occurs when an external scanner is connected or disconnected (default).
- **On connect** - Selects the external scanner as the default scanning device immediately upon connection.
- **On disconnect** - Reverts to a built-in scanner based on its position in an internally managed scanner list (which varies by host device). This is usually the scanner most recently used prior to the external connection (see notes below).
- **On connect/disconnect** - Selects an external scanner as the default scanning device immediately upon connection. Upon disconnection, reverts to the scanner set as the default prior to the external connection.

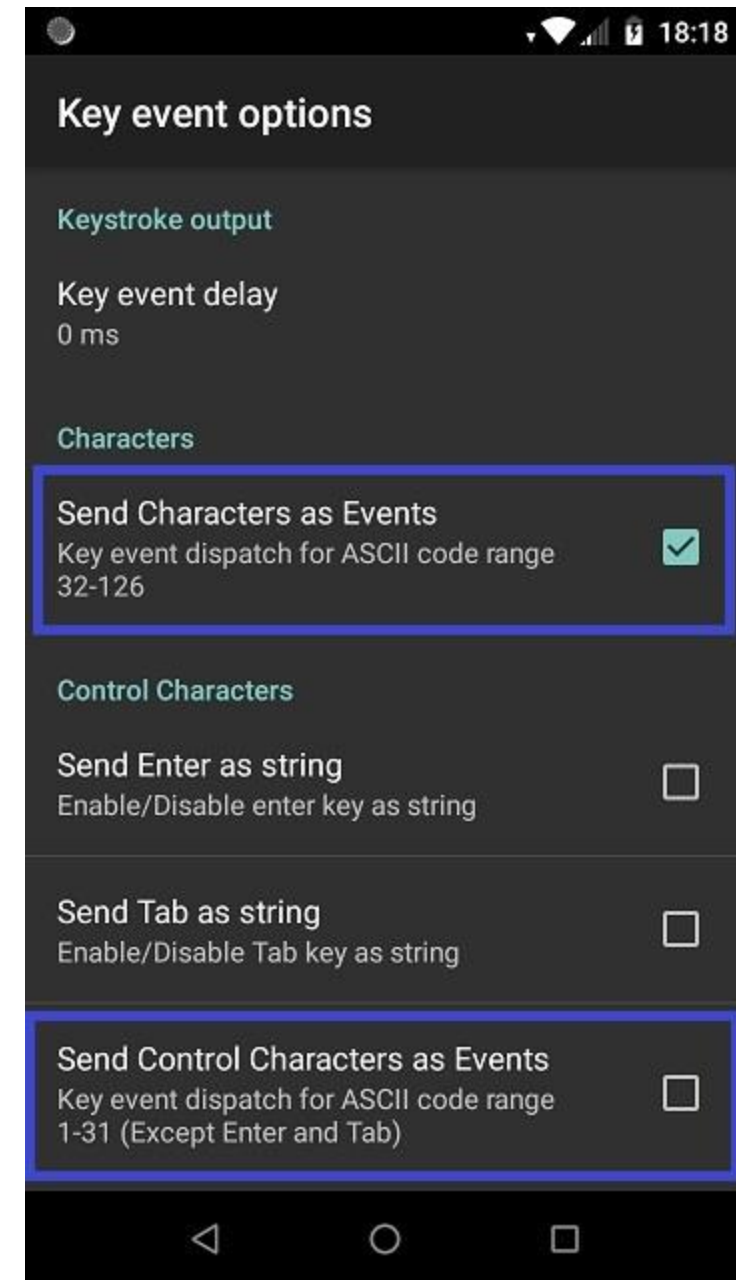


Latest Features in DataWedge 8.x

Other Enhancements: Send Characters as Events

KeyStroke 'send Characters as Events'

- Primary use case:
 - Web application capturing barcode data, written in Chrome (could be a PWA or other hybrid framework app that does not want to make use of native plugins).
 - Capture barcode data by listening for key events on the DOM.
 - Previously, this was not easily achievable without a specialised ADF rule or using Enterprise Browser.
- Associated developer portal post:
<https://developer.zebra.com/blog/listening-keypress-events-datawedge>
- From DataWedge 7.3



Latest Features in DataWedge 8.x

Other Enhancements: Auto Import

Auto Import

DataWedge supports remote deployment of Config files (`datawedge.db`) and Profiles (`dwprofile_profilename.db`) to devices through commercially available third-party Mobile Device Management (MDM) systems. When DataWedge launches, it checks the `/enterprise/device/settings/datawedge/autoimport` directory for the presence of such files. If any are found, it executes the functions below.

DataWedge Auto-Import routine:

1. Import the new file(s)
2. Replace the existing Config file and like-named Profile(s) (if any)
3. Delete the imported files
4. Put new settings immediately into effect

While DataWedge is running, it receives a system notification whenever a Config file or Profile is placed in the `/autoimport` folder and executes the same four functions.

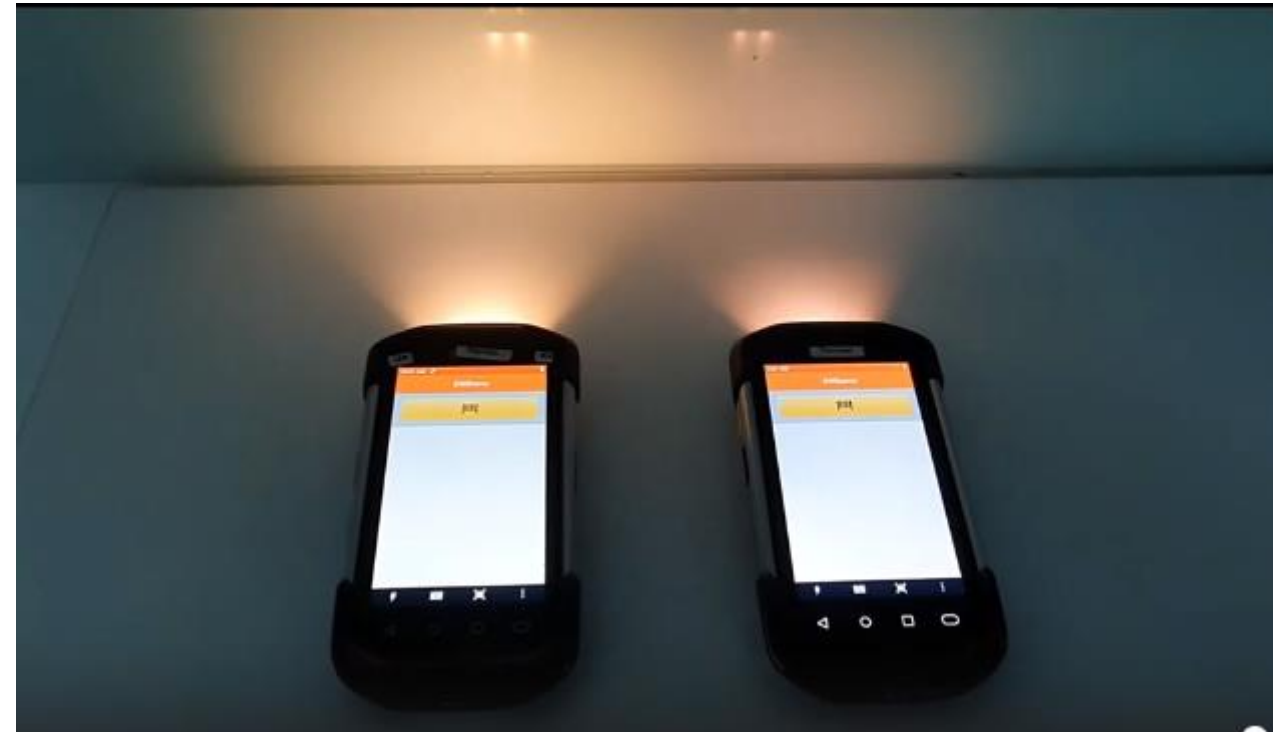
Important Notes:

- For the best experience, **Zebra strongly recommends that users be advised to exit any DataWedge configuration UI screen** before new Config files are remotely deployed.
- **On devices running Android KitKat or later**, the `/enterprise` folder cannot be seen with File Explorer or other user-level tools. Moving configuration files to and from the `/autoimport` or `/enterprisereset` folders must be done programmatically, or with a staging client app or MDM.
- **DataWedge versions prior to 6.9** attempt to consume any of the monitored ".db" files as soon the file name(s) appear in the `/autoimport` folder. Therefore, **it is possible for DataWedge to attempt to consume a file before it is completely written**. To avoid this condition, **Zebra recommends initially storing the file with an alternate extension** (i.e. ".tmp") and changing the extension to .db once writing is complete.
- **Zebra recommends applying explicit file permissions to the all .db files** so that DataWedge will not be impeded from any of its file procedures.

Latest Features in DataWedge 8.x

Other Enhancements: Illumination brightness

- Found under DataWedge scanner reader parameters
- Values between 10 (maximum) & 0 (minimum)
 - Can be used to conserve battery
 - As shown on the right
- Separate setting to disable illumination



Latest Features in DataWedge 8.x

Other Enhancements: Wakeup and Scan

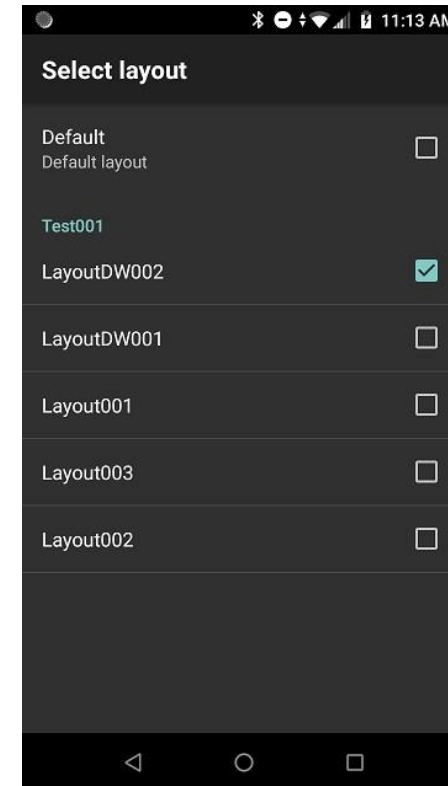
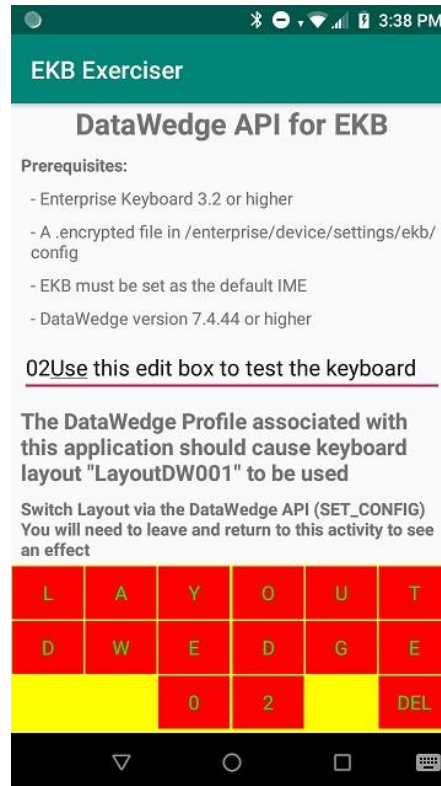
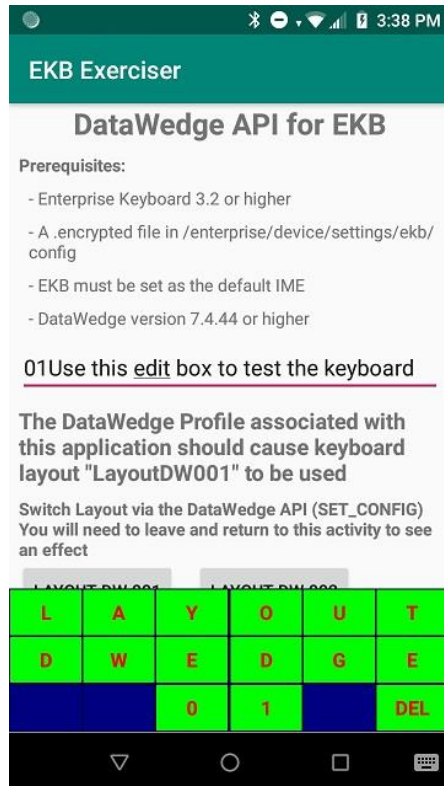
- Wakeup the device and scan in a single trigger pull
- Found under scanner reader parameters
- From DataWedge 8.1

Reader params	
LCD Mode	Disabled
Linear Security Level	Security Short Or Codabar
HW Engine Low Power Timeout	250
Picklist	Disabled
Poor Quality Decode Effort	Effort Level 0
Same Symbol Timeout	500
Trigger Wakeup and Scan	<input type="checkbox"/>

Latest Features in DataWedge 8.x

Enterprise Keyboard Integration

- You can switch keyboard layouts dynamically using DataWedge and Enterprise Keyboard
- Associate the EKB layout with your app or activity using a DataWedge profile
- **More information in a future DevTalk** (Provisionally November 2020)
 - Sample app: https://github.com/darryncampbell/Enterprise_Keyboard_Exercise



Latest Features in DataWedge 8.x

Resources

- DataWedge TechDocs links:
 - Getting Started: <https://techdocs.zebra.com/datawedge/8-0/guide/gettingstarted/>
 - Profiles: <https://techdocs.zebra.com/datawedge/8-0/guide/profiles/>
 - APIs: <https://techdocs.zebra.com/datawedge/8-0/guide/api/>
 - Manager: <https://techdocs.zebra.com/mx/datawedgemgr/>
- Official DataWedge Samples (including Signature Capture):
 - <https://github.com/ZebraDevs/DataWedge-Android-Samples>
- NextGen SimulScan – MultiBarcode Demo:
 - <https://github.com/darryncampbell/DataWedge-MultiBarcode-Sample>
- DataWedge Intent plugin – Component Demo:
 - <https://github.com/darryncampbell/DataWedge-Component-Sample>
- Getting started developing for Zebra devices: <https://youtu.be/njo9iNs2zrA>
- List of DataWedge articles from Darryn: https://darryncampbell.co.uk/technology_index.html



Questions?

<http://developer.zebra.com>



Zebra Developer Community – LinkedIn Group



@ZebraDevs