Zebra Services Agent

User Guide

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About This Guide

This guide provides comprehensive instructions for using the Zebra Services Agent (ZSA), a versatile mobile application designed to enhance the functionality of Zebra mobile computers running the Android platform.

1. **VIQF Smart Battery Health**: This feature monitors the battery health of Zebra devices and provides alerts and detailed information about the battery's status.
2. **Drop Detection**: This feature utilizes the device’s accelerometer sensor values to detect and notify users when a device falls. The detection is based on the configured sensitivity value, which administrators can adjust according to specific operational needs.
3. **Data Collection**: This feature supports the collection of machine data from non-Zebra devices and uploads it to the server for further analysis.
4. **Diagnostic Tool**: A utility designed to test the hardware functionality of devices, perform various diagnostic tests, and upload the results for troubleshooting. Administrators can trigger tests instantly or schedule them periodically to monitor and improve device health.
5. **Application Configuration**: The ZSA application allows the configuration of other applications, such as Zebra Data Services (ZDS) and Wireless Insight, on Zebra devices.
6. **Device Actions**: Enables remote log collection for streamlined troubleshooting and allows sending messages to one or multiple devices for direct communication. It also provides real-time outdoor location tracking, ideal for logistics and field operations to monitor and manage assets efficiently.
7. **Advanced Troubleshooting**: This feature provides real-time alerts to users when devices encounter frequent drops, Wi-Fi or Bluetooth disconnections, or unexpected reboots.
8. **Log Collection for Non-Zebra Devices**: Expanded ZSA capabilities to collect application logs from non-Zebra devices, broadening its scope to identify issues effectively.
9. **ZSA as a Mediator**: This enables receiving data from other apps and sending it to the server. With this, ZSA works as a mediator between any app and server to upload data.

These make the ZSA a powerful tool for managing Zebra and non-Zebra devices, each with specific features tailored to maximise efficiency and performance.

Functional Overview

The ZSA mobile application includes several important modules, such as battery health verification, function diagnostics, and drop detection, ensuring comprehensive device monitoring.

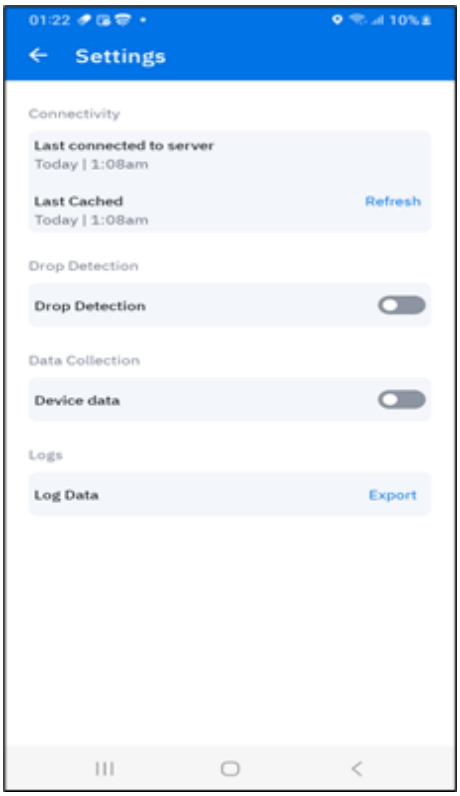
- System Configuration
- VIQF Smart Battery Health
- Drop Detection
- Data Collection
- Diagnostic Tool
- Application Configuration
- Device Actions
- Advanced Troubleshooting
- ZSA as a Mediator

System Configuration

The System Configuration module serves as the foundation for managing key operational settings of the ZSA application. It allows administrators to enable or disable the entire application, set log levels for efficient monitoring and debugging, and configure file and data upload processes, including retry mechanisms for failed uploads. Additionally, it provides control over the data collection module, allowing for the enabling or disabling of it as needed. This feature is also enhanced with log collection in a file for analysis of the use of the application.

Log Collection in a File

This function enables the collection of application logs from non-Zebra devices, broadening its scope to notify of issues effectively. By default, it is disabled; Admin can enable it via CTL or Managed Configuration. Logs can be exported from the settings screen of the ZSA.



NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable to Zebra and non-Zebra devices.

The configurations are in the following table.

Key	Description	Default value	Min	Max
Enable/Disable of ZSA	Enable or disable ZSA.	true		
Configuration of the log level for ZSA	Specifies the logging level (0: Info, 1: Debug, 2: Sensitive).	1	0	2
Log collection in a file	Keeps application logs in a file for analysis.	false		

Key	Description	Default value	Min	Max
File upload URL	URL where device logs are uploaded for analysis.	https://z4z.t.eu.fs.viq.zebra.com/systemconfig-service/api/v1/public/upload-scan-results		
File upload retry count	The number of retry attempts for uploading files in case of failure.	3	1	5
File upload retry interval in minutes	Time interval (in minutes) between retry attempts for file uploads.	15	15	60
Data upload URL	URL for uploading analytics data.	https://analytics.zebra.com/client2		
Data upload interval in minutes	Interval (in minutes) for data upload cycles.	1440	30	1440
Enable/Disable of data collection	Boolean indicating whether device data collection is enabled.	false		
Allow user to toggle data collection	Boolean toggle for enabling/disabling device data collection.	true		
Account Number	Only for non-Zebra devices (optional).			

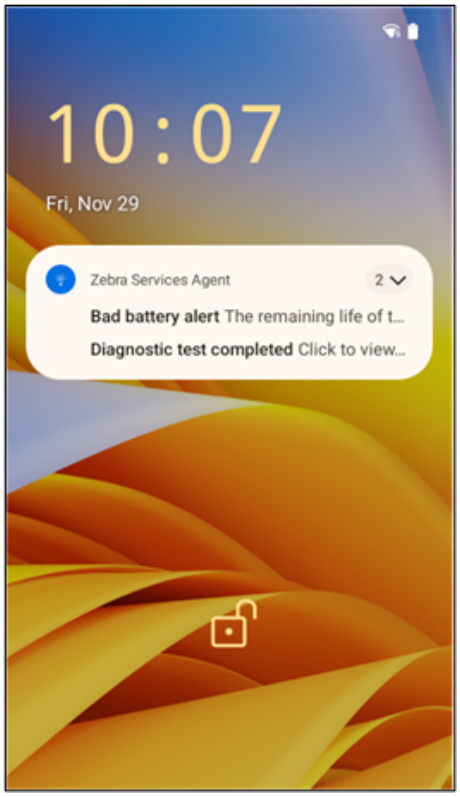
VIQF Smart Battery Health

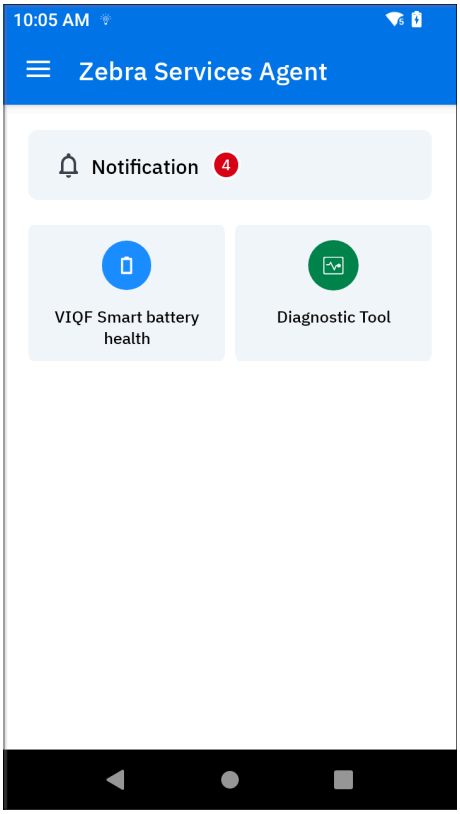
ZSA is designed to have real-time **Alert on Device** capabilities for VisibilityIQ Foresight (VIQF) and Proactive Battery Replacement (PBR) Services. Admin can disable this module if bad battery alerts are not needed for the device.

NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable only to Zebra devices.

Alert capabilities for VIQF:

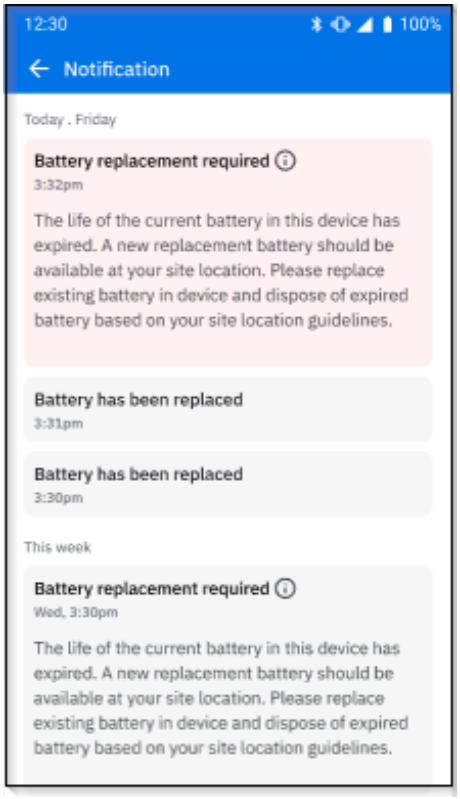
- Identify VIQF **Replace Now** batteries with less than 30 days of useful life left easily through on-device battery alerts.
- The device generates an alert message whenever it is swapped with a faulty battery. The app checks for cold battery swaps (via device reboot) and warm swaps (without device reboot).
- Highlights battery health and battery details on the app.

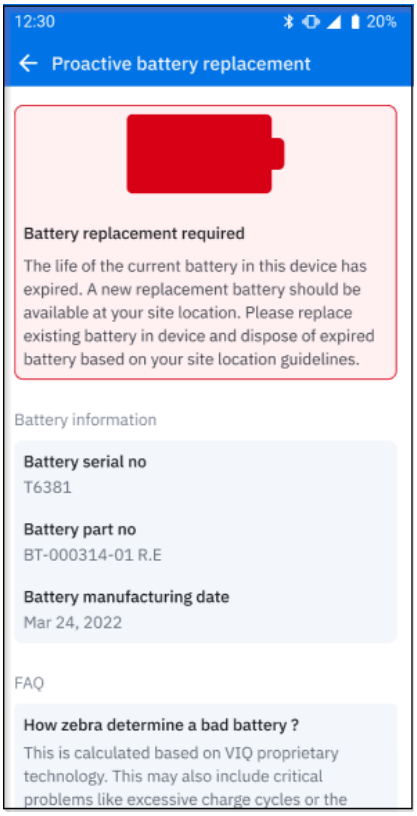




Alert capabilities for VIQF smart battery health Services:

- Identify faulty batteries for which a replacement is sent to the customer's location. There is a 20-day period before an alert displays to allow the replacement battery to reach the customer's location.
- The device generates an alert message whenever it is swapped with a faulty battery. The app checks for cold battery swaps (via device reboot) and warm swaps (without device reboot).
- Highlighting battery health and battery details on the app.





The configurations are in the following table.

Key	Description	Default value	Min	Max
Enable/Disable PBR configuration	Boolean indicating whether PBR is enabled.	true		
Custom message to show in the notification	Custom message displayed for bad battery alerts.	Default message defined by Zebra.		
Alert the user of a bad battery through a notification or dialog box	Specifies the type of alert (0: Notification, 1: Pop with OK button, 2: Pop with OK and Need Assistance button).	0	0	2
Block device usage	Boolean indicating whether the device should be blocked due to the alert.	false		

Drop Detection

The Drop Detection module of the ZSA mobile application uses the Android accelerometer sensor to detect when a device has been dropped. When a drop is detected, the application notifies the user and automatically uploads the fall data to the server. This feature is disabled by default but can be enabled through the settings configuration.

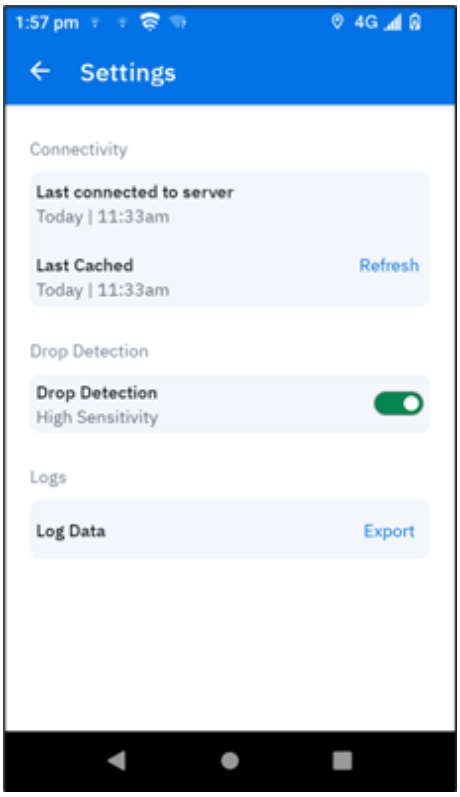
NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable to Zebra and non-Zebra devices.

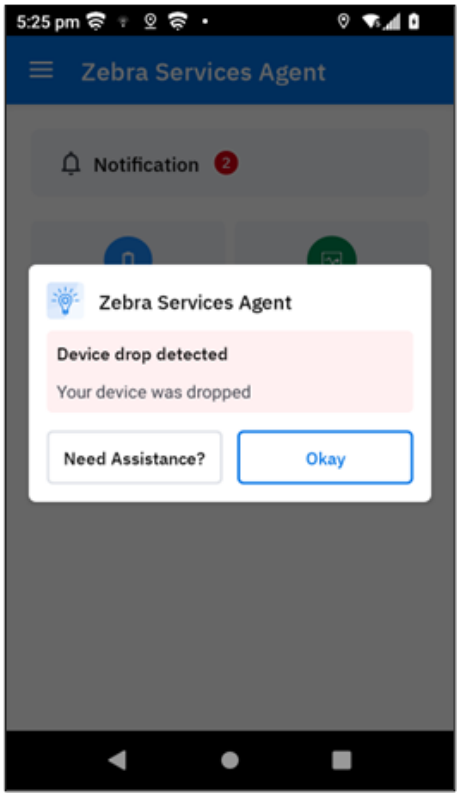
New Features:

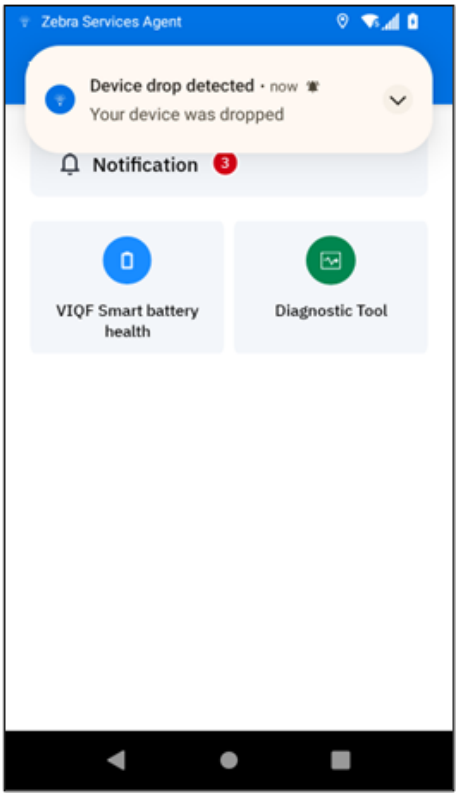
Enhanced Alert Options: In addition to standard notifications, users can now receive alerts via dialog boxes when a drop is detected. This dialog not only informs the user of the drop but also provides assistance or guidance if required, ensuring a more interactive and responsive user experience.

Drop Sensitivity Levels: Added the ability to configure drop sensitivity with predefined levels such as High, Medium, and Low. Additionally, a Custom option allows administrators to specify a custom sensitivity value, offering precise control over drop detection based on specific operational needs.

These enhancements offer users flexibility in how they receive alerts and ensure that they are promptly informed about device drops, with support readily available if needed. If the Admin provides access, the user can enable or disable drop detection from the settings screen.







The configurations are in the following table.

Key	Description	Default value	Min	Max
Enable/Disable of drop detection	Boolean indicating whether drop detection is enabled.	false		
Drop sensitivity level / Drop sensitivity	Specifies the sensitivity level (0: High, 1: Medium, 2: Low, 3: Custom). Drop Sensitivity: Specifies the sensitivity value affected if the drop level is set to 3.	1	0	3
Alert the user of a device drop through a notification or dialog box	Specifies the type of alert (0: Notification, 1: Pop with OK button, 2: Pop with OK and Need Assistance button).	0	0	2
Allow user to toggle drop detection	Boolean toggle for enabling/disabling drop detection.	true		

Data Collection

The Data Collection Module of the ZSA mobile application is designed to gather a wide range of data to support device management and analytics. The collection interval and schedule upload can be configured and details are provided in the configuration table.

NOTE: This feature can be configured using Managed Configuration through MDM and is applicable only to non-Zebra devices. By default, the data collection is disabled. When the admin enables data collection, all default data collection starts capturing data. Admin can only enable or disable the collections that are non-default.

This module provides data management capabilities, empowering administrators with detailed insights while offering the flexibility to adapt data collection practices as needed. This module collects various types of information, including:

- Battery Information: Details about battery health and status.

  Default: Enabled

- Device Information: Specifications and operational status of the device.

  Default: Enabled

- Application Information: Comprehensive data regarding installed applications, including events such as installations, uninstallations, upgrades, and downgrades of any application on the device.

  Default: Enabled

- Application Usage: Aggregated data analysis and usage patterns of applications to provide insights into device and application performance.

  Default: Enabled

- WLAN Information: Captures WLAN-related data, including when the device connects to or disconnects from Wi-Fi networks.

  Default: Disabled

- GPS Stats: Collects the device's location every 15 minutes and uploads the last collected location every hour.

  Default: Disabled

- Battery Events: Captures key battery-related events such as low battery, charger connect/disconnect, battery swap, screen on/off, and device shutdown.

  Default: Enabled

- Bluetooth Events: Collects data whenever a device connects to or disconnects via Bluetooth.

  Default: Enabled

- Low RAM Events: Captures data when low RAM conditions are detected on the device.

  Default: Disabled

- RAM Stats: Collects and records the device's RAM space status every hour.

  Default: Enabled

- Flash Stats: Captures the flash memory status of the device every hour.

  Default: Enabled

- Utilization: Records data about device uptime, categorized based on the hour of the day.

  Default: Enabled

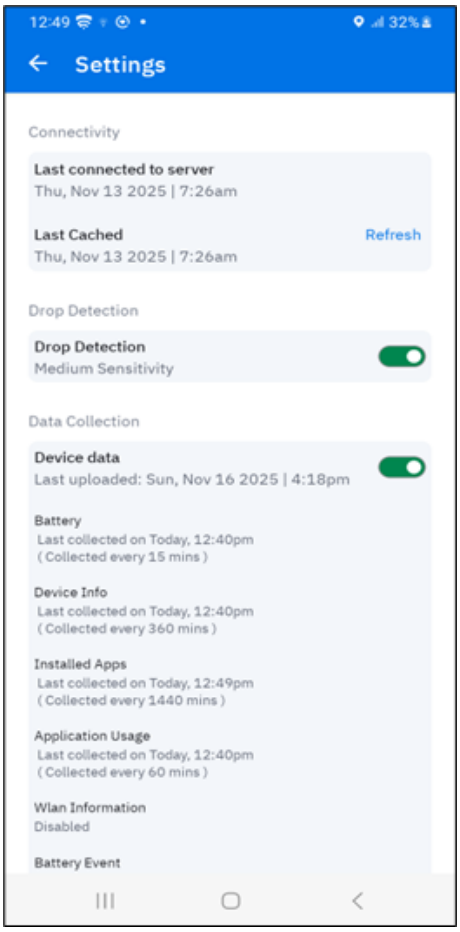
- Geo Fencing: Captures data when the device moves out of a defined geographic fencing radius.

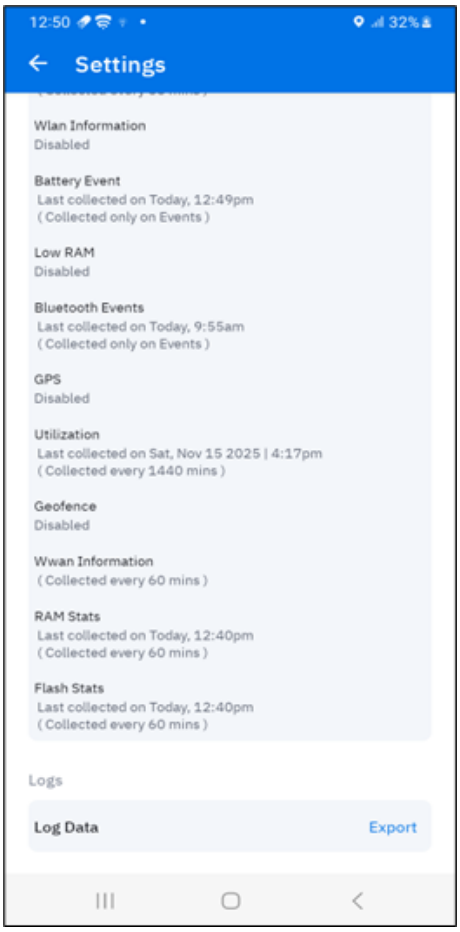
  Default: Disabled

- WWAN Information: Collects device SIM card information such as network, operator, signal level and so on.

  Default: Enabled

The details of the last collected and uploaded data are accessible through the settings screen. Users can view this information and, if granted access by the administrator, can enable or disable data collection using the toggle button provided.





Diagnostic Tool

This module of the ZSA mobile application provides tests that verify the device's hardware functionality to determine the system's health and its result. When necessary, the Zebra Help Desk uses this tool to troubleshoot device issues, using the results to determine the ideal steps for resolution. This functionality is beneficial for quickly addressing device problems, increasing worker productivity, and reducing device downtime and unnecessary returns to the Zebra Repair Center.

New Enhancements:

Support for Non-Zebra Devices: The Device Diagnostic Tool (DDT) is now extended to non-Zebra devices, enabling advanced diagnostics across a wider range of hardware and increasing its versatility.

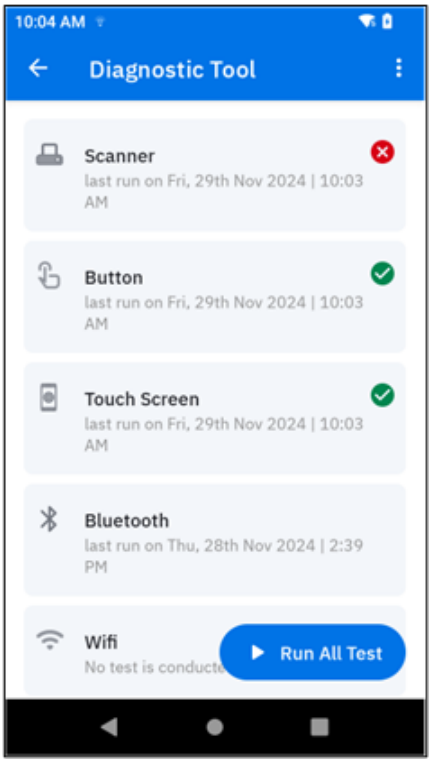
Immediate and Scheduled Testing: Admin can trigger tests immediately or schedule them as one-time or recurring tests, ensuring proactive and efficient device health monitoring.

Diagnostic Tool Tests	Zebra Support	Non-Zebra Support
Scanner	Yes	Partial (It is supported only on Datalogic and Honeywell devices)

Diagnostic Tool Tests	Zebra Support	Non-Zebra Support
Button	Yes	Yes
Touch Screen	Yes	Yes
Bluetooth	Yes	Partial (It is supported only on Android 12 and below versions)
Wi-Fi	Yes	No
Battery	Yes	No
WWAN	Yes	No
Audio	Yes	Yes
SD Card	Yes	Yes
USB	Yes	Yes
Network	Yes	Yes
Keyboard	Yes	Yes
Camera	Yes	Yes

NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable to Zebra and non-Zebra devices (partially).

1. Users access the **Diagnostic Tool** module from the home screen of the ZSA mobile application. The main screen of this module displays a list of tests that help identify the device's system health and determine whether it needs to be sent to the Zebra Repair Center.

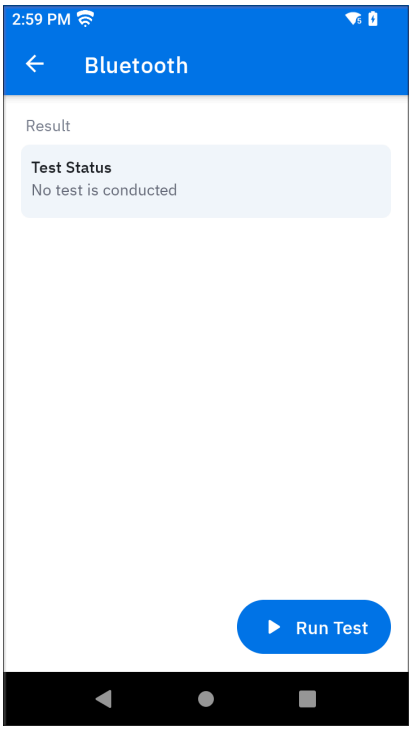


2. The **Run All Test** runs all the listed tests in sequence to verify the system's health and simultaneously generates a result report.

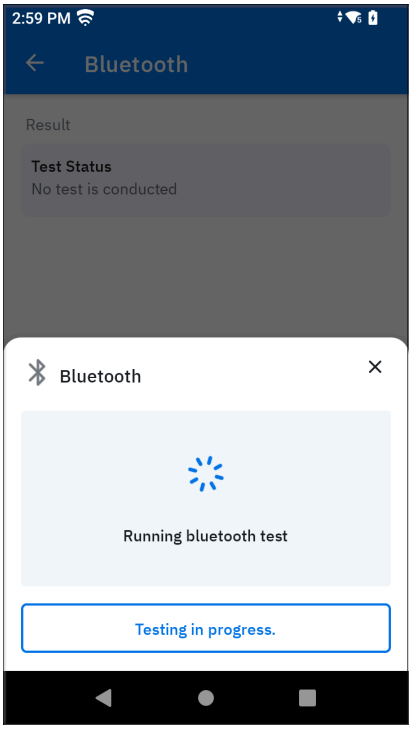
3. Users can perform individual tests to verify if a specific device function works correctly. After each test, the results are saved to a file and uploaded to the designated FTP network. The outcome of the test is also displayed on the test result screen.

   Below is an example of a **Bluetooth** test.

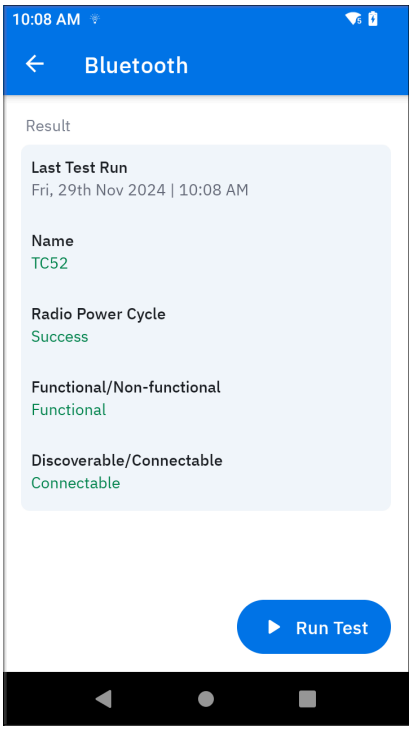
   - Click **Run Test**.



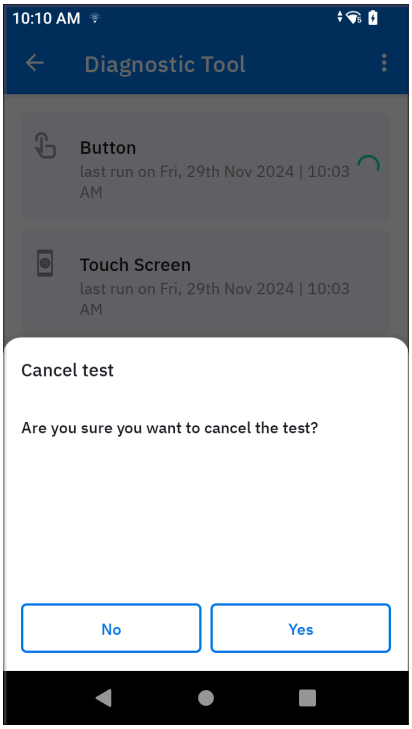
   - The **Testing in Progress** page displays.



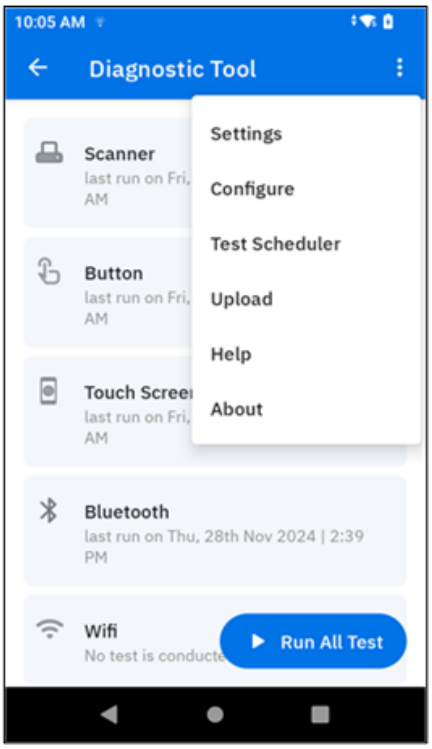
- After completing the test, the **Result** page displays.



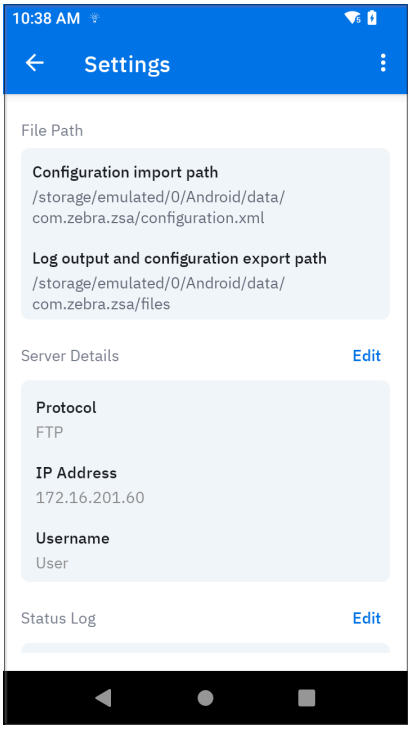
- Users can cancel the test while it is in progress. A message prompts for confirmation with options for **Yes** or **No.**



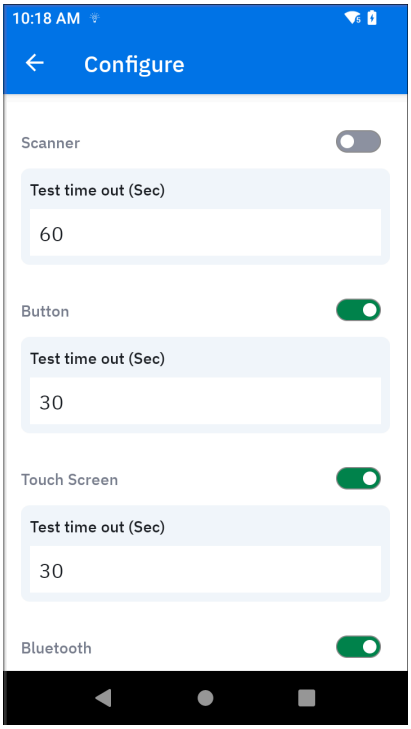
4. The **Diagnostic Tool** module includes additional features, such as **Settings**, **Configure**, **Test Scheduler**, **Upload** and the option to enable or disable tests.



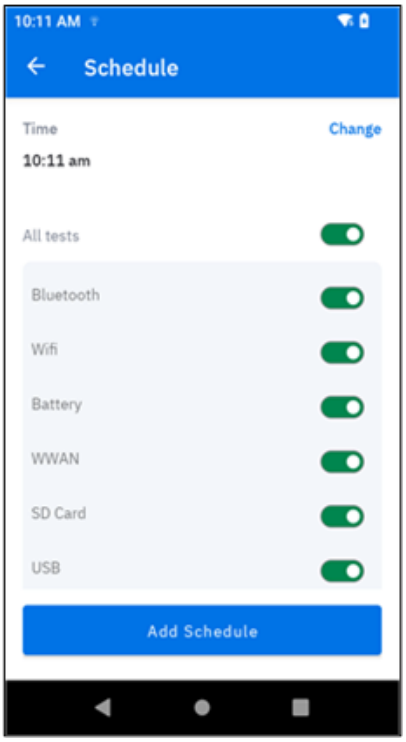
5. The **Settings** feature allows users to import diagnostic tool configurations from a configuration XML file, export the current configuration to a file for later use, or use the same configuration on different devices. The user can also configure the FTP server to upload test logs to a specific server.

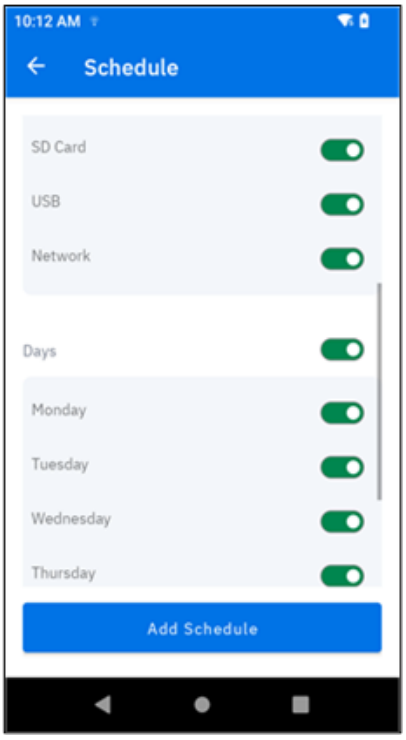


6. The **Configure** feature provides different required configurations related to performing any test. This feature allows users to enable or disable tests and specify the time interval allocated to finish the test. The user can also view a list of sub-tests and enable or disable them from the configure test page.

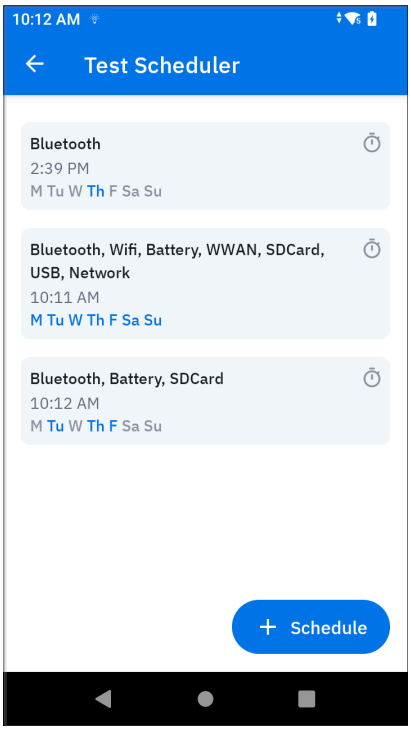


7. The **Test Scheduler** feature allows scheduling weekly tests that are automatically executed at a specific time of the day. All the schedulers are visible on the schedule tests screen, as displayed below.

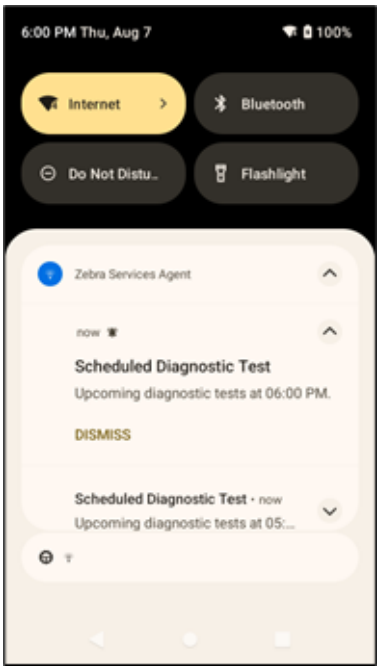




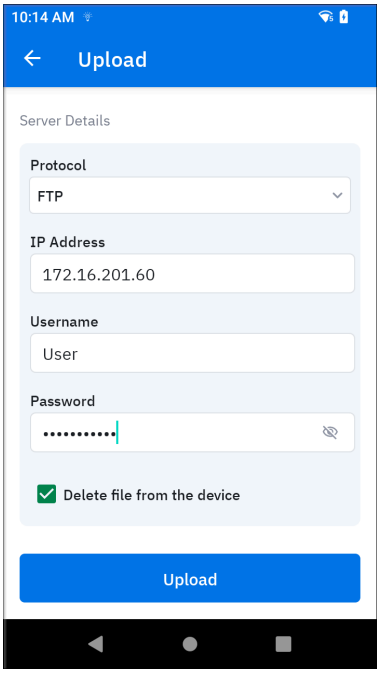
8. By selecting the **Time**, **All Tests**, and **Days** of the week, the tests are scheduled to run automatically in the background at the specified times on the chosen days.



9. A new pre-alarm feature has been added to DDT tests, providing an alarm notification 15 minutes before a scheduled test. Users have the flexibility to dismiss the upcoming test directly from the notification if needed. When a test is dismissed, feedback regarding the action is automatically sent to the server for tracking and analysis.



10. After completing the test, whether successful or unsuccessful, the results are saved and uploaded to the designated FTP server. Users can modify server configurations via the **Settings** feature or the **Upload** feature. The **Upload** feature allows users to manually upload data to the FTP server anytime, even without conducting tests.



The configurations are in the following table.

Key	Description	Default value	Min	Max
Enable/Disable DDT	Enable or disable the Diagnostic Tool.	true		
Clear DDT configurations	Whether to clear the Diagnostic Tool configuration.	false		
Upload preference	Upload the log file for the condition only (1: Only on Failure, 2: All test logs).	1/2	1	2
Test-log retention	Action after log upload (0: Keep the log file, 1: Delete the log file).	0/1	0	1
Trigger DDT full suite	Triggers the full DDT test suite immediately.	false		
Run DDT instantly	Triggers DDT tests, which do not require user intervention immediately.	false		
Schedule tests on specific dates	Schedule tests based on date (in DD-MM-YYYY format).	None		
Schedule tests on specific days	Schedule tests based on days of the week (in MON,TUE,WED format).	None		
Schedule tests at specific time	Time of the day for the test (in HH:MM format).	None		
Test Plan - System to test	Name of the test (for example, Bluetooth). Only non-user intervention tests.	None		
Test Plan – Test Day and Test Time	Specify the Day of the week for the test (for example, Monday) and the Time of the day for the test (in HH:MM format).	None		
Test Plan - Delivery	Specify FTP username, FTP protocol, FTP password, and FTP server IP address.	None		

Application Configuration

The Application Configuration Module of the ZSA mobile application is designed to provide advanced configuration capabilities for other applications on Zebra devices. This module empowers users to customize settings and optimize application functionality directly from the ZSA application, enhancing operational efficiency and device management. The module currently supports the customization of configuration settings for two specific applications:

NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable only to Zebra devices.

1. Zebra Data Service (ZDS): This feature enables or disables the ZDS with a customized configuration through VIQ only.
2. Wireless Insight: This feature enables or disables the advanced logging specific to wireless communications through MDM or VIQ configuration.

The configurations are in the following table.

Key	Description	Default value	Min	Max
ZDS Configuration: Payload	Encrypted data (specific to ZDSConfiguration).	None		

Key	Description	Default value	Min	Max
Wireless Insight Configuration: configuration ID	Pre-defined Configuration ID (specific to WirelessInsightConfiguration, 1: Start W-Fi Analysis, 2: Start Cellular Analysis, 3: Start Wi-Fi and Cellular Analysis, 4: Stop Wi-Fi Analysis, 5: Stop Cellular Analysis, 6: Stop Wi-Fi and Cellular Analysis).	1	1	6
Wireless Insight Configuration: custom configuration	Accepts custom wireless configuration.	None		

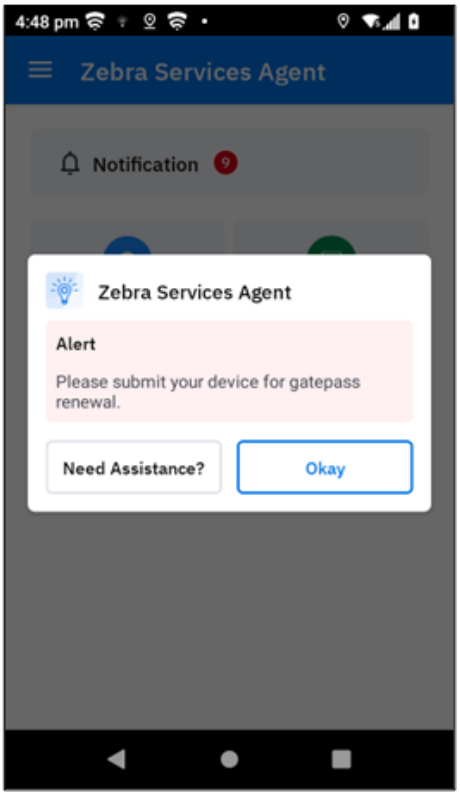
Device Actions

The Device Actions Module in the ZSA mobile application offers a suite of powerful functionalities designed to enhance device management and operational efficiency. This module provides administrators with tools to interact with devices, gather valuable data, and track device locations.

- Device Alert:

  Administrators can display alert messages on devices either as notifications or dialogue boxes.

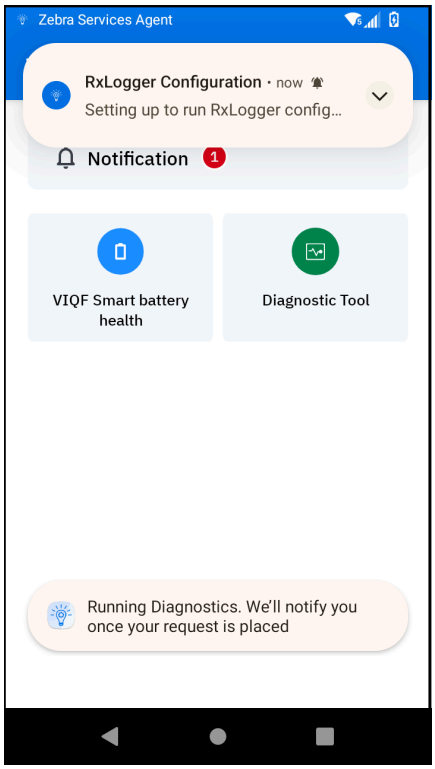
NOTE: This feature can be configured through VIQ and is applicable to Zebra and non-Zebra devices.



- Collect Logs:

  This functionality enables a one-time action to apply custom configurations to RxLogger for a specified duration. Additionally, this feature supports the inclusion of Diagnostic Tool during the logging period.

NOTE: This feature can be configured through VIQ and is applicable only to Zebra devices.

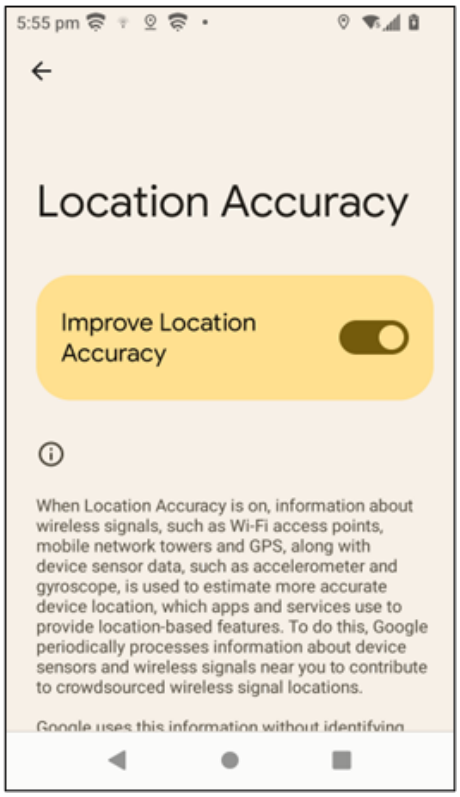


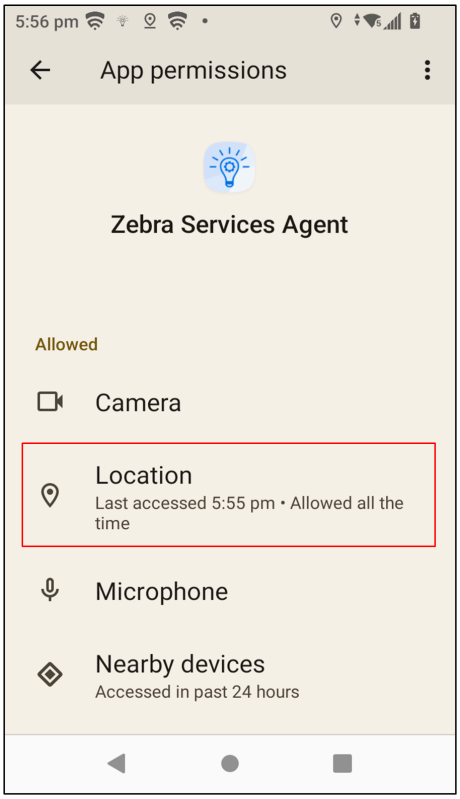
- Outdoor Location Tracking:

  Administrators can start or stop outdoor location tracking for a specific duration, enabling real-time monitoring of device movement. The application allows configuration of the interval for location updates, ensuring that location data is collected at a frequency suitable for operational needs and

resource management. The prerequisite is that the ZSA application has granted the location permission and the device's Location Accuracy setting is enabled.

NOTE: This feature can be configured through VIQ and is applicable to Zebra and non-Zebra devices.





The configurations are in the following table.

Key	Description	Default value	Min	Max
Device Alert: Message	Message displayed to the user.	Empty		
Device Alert: Alert Type	Specifies the type of alert (0: Notification, 1: Pop with OK button, 2: Pop with OK and Need Assistance button).	0	0	2
Collect Log: DDT test required	Boolean specifying whether diagnostic tests are needed.	true		
Collect Log: Log duration in minutes	Duration (in minutes) for log collection.	5	5	1440
Collect Log: Custom RxLogger Config	Custom configuration for the RxLogger.	Empty		
Outdoor Location Tracking: Action	Action to perform (for example, start).	start		
Outdoor Location Tracking: Collection interval in seconds	Interval (in seconds) between location data collection points.	30	30	300

Key	Description	Default value	Min	Max
Outdoor Location Tracking: Collection duration in minutes	Total duration (in minutes) for location tracking.	60	60	1440

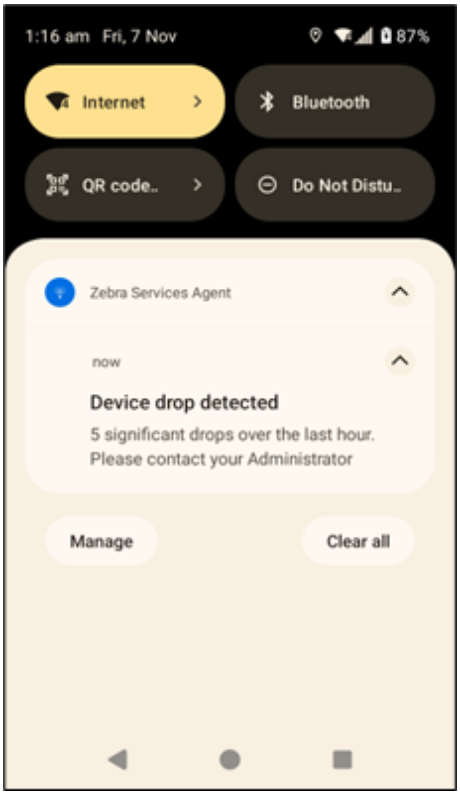
Advanced Troubleshooting

The Advanced Troubleshooting feature now provides real-time alerts to users when devices encounter frequent drops, Wi-Fi or Bluetooth disconnections, or unexpected reboots. These alerts include detailed information about the issues, enabling admin to quickly identify and resolve problems.

- Frequent drop detection
- Frequent Wi-Fi disconnection
- Frequent Bluetooth disconnection
- Multiple device reboot

The advanced troubleshooting feature is designed to identify recurring issues by monitoring a minimum of 5 occurrences of any specific event within the past 60 minutes. This ensures that only significant and repeated issues are flagged for attention. By default, this feature is disabled to avoid unnecessary monitoring.

When a troubleshooting event is detected, a notification is displayed on the device to alert the user, and the related data is automatically uploaded to the server for further analysis and resolution.



NOTE: This feature can be configured using Managed Configuration through MDM or VIQ and is applicable to Zebra and non-Zebra devices.

The configurations are in the following table.

Troubleshoot event	Key	Description	Default value	Min	Max
Drop detection	Enable/Disable troubleshooting	Boolean indicating whether drop detection troubleshooting is enabled.	false		
Wi-Fi disconnection	Enable/Disable troubleshooting	Boolean indicating whether frequent Wi-Fi disconnection troubleshooting is enabled.	false		
Bluetooth disconnection	Enable/Disable troubleshooting	Boolean indicating whether frequent Bluetooth disconnection troubleshooting is enabled.	false		
Device reboot	Enable/Disable troubleshooting	Boolean indicating whether frequent device reboot troubleshooting is enabled.	false		

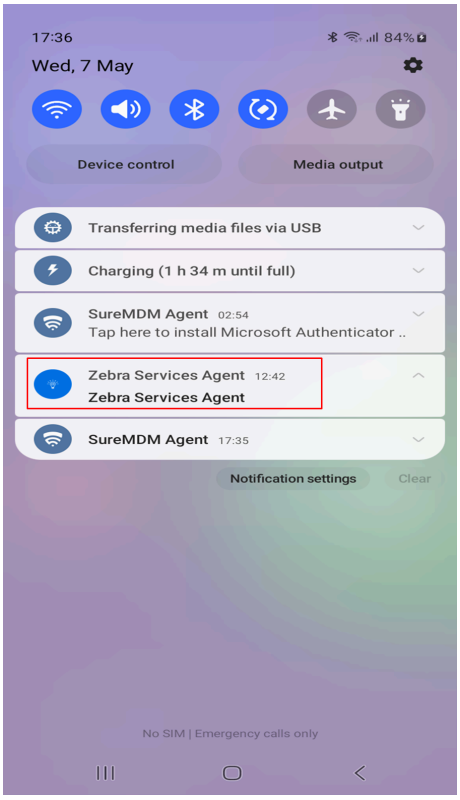
ZSA as a Mediator

With this feature, ZSA now serves as a mediator, capable of accepting data from third-party applications and uploading it to the server. Please reach out to the ZSA Zebra team for the developer guide.

NOTE: This feature is applicable to Zebra and non-Zebra devices.

Configure the ZSA Mobile Application

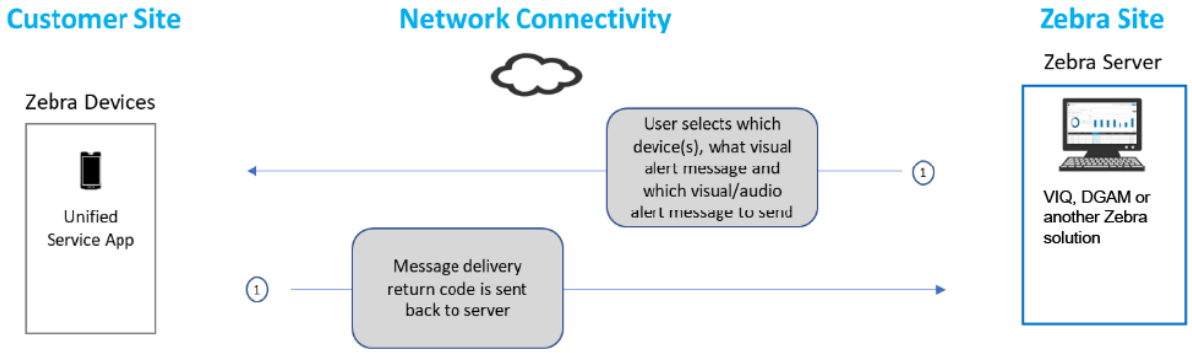
These features can be configured using Managed Configuration through MDM or VIQ. To receive managed configurations, ZSA displays a foreground notification in the device notification panel.



High-Level Design Overview

The Zebra Services Agent (ZSA) includes the following elements:

1. **ZSA Mobile Device Application**: This app is deployed on the device via Mobile Device Management (MDM) and starts as a service when the device boots up. The application provides user interface screens for interaction, shows notifications, and launches or terminates other Zebra applications. It is only supported on the Android platform.
2. **ZSA Server-Side Platform**: The server-side software and infrastructure are hosted in Zebra's Virtual Private Cloud on the Google Cloud Platform. The server infrastructure is a multi-tenant solution that provides data security and confidentiality.



Zebra Services Agent Requirements

Zebra Services Agent (ZSA)
Requires 20.1 MB RAM
Requires 30 MB of storage memory
The impact on battery discharge is less than 2% over 24 hours.

Prerequisites

For deploying the Zebra Services Agent (ZSA) app and enabling alert notifications on the device:

1. The customer requires MDM to deploy APK to the devices. Supported MDM platforms are SOTI, AirWatch, and 42Gears.
2. The devices require an Android operating system version 10 or higher.
3. The Zebra Data Services (ZDS) and Zebra Services Agent (ZSA) must be enabled on the device. If the devices are behind a corporate firewall, ensure the ZDS and ZSA cloud servers can be reached. Below are the server info and port used by ZDS and ZSA:
   - Server 1: https://analytics.zebra.com using IP address 104.198.59.61 on Port: 443
   - Server 2: https://device-https.savannacore.zebra.com using IP address: 34.68.84.87 on Port: 443
   - Server 3: https://usa.eu.zebra.com on Port:443

NOTE: The servers can only be accessed by the software team via an internal endpoint.

4. Enable network connectivity on devices (WWAN or WLAN).

NOTE: Zebra recommends using DNS server names (instead of IP addresses) when allowlisting to avoid service interruptions due to IP address changes.

Android Version and Language Support

This section shows the supported Android operating system and languages.

Android Operating System	10 and above
Languages	English

Installation

- The Zebra team shares APK files with the customer admin.
- APK files are installed on devices via Mobile Device Management (MDM).

Information

This section provides information on Zebra Data Services (ZDS) and Diagnostic Tool.

You can enable the ZDS agent using the link below:

- zebra.com/zds-setup
- zebra.com/VisibilityIQF

For more information on Diagnostic Tool, refer to the link below:

- zebra.com/diagnostic-tool