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## Automatically Deploying Connected and Centrally-managed Retail Demo Devices

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## **Automatically Deploying Connected and Centrally-managed Retail Demo Devices**

### **ABSTRACT**

Manufacturers of electronic devices have thousands of demonstration (demo) devices deployed in retail environments across the world. Deploying connected retail demo devices across third-party retailers is expensive, time-consuming, unscalable, and subject to human error. This disclosure describes mechanisms for automatically deploying connected and centrally-managed demo devices at retail locations. Wireless network credentials are pre-registered with a device manufacturer and included in a configuration file that is imaged onto a demo device. Upon power on, the demo device automatically searches for and connects to a retailer Wi-Fi network. The device sends heartbeats to a centralized dashboard to enable geolocating and monitoring. The device can then be remotely configured and can transmit demo interaction analytics to the centralized dashboard.

### **KEYWORDS**

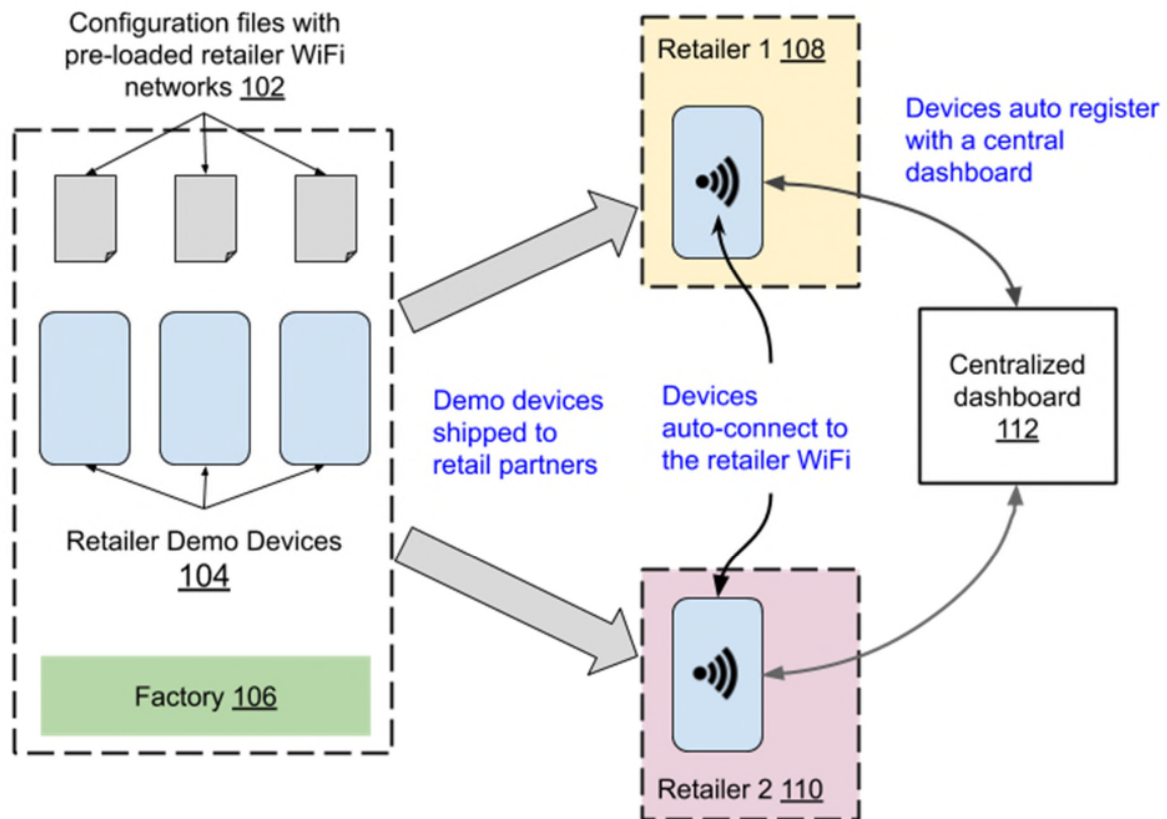
- Retail demo
- Demo device
- Demo mode
- Demonstration device
- Factory image
- Demo analytics
- Geolocation
- Retailer Wi-Fi

## BACKGROUND

Manufacturers of electronic devices have thousands of demonstration (demo) devices deployed in retail environments across the world. Deploying connected retail demo devices across third-party retailers is expensive, time-consuming, and unscalable. Typically, a third-party installer or retail associate needs to follow a series of steps to connect a device to a retailer Wi-Fi network and associate it with a specific retail chain or store. The process of connecting demo devices and monitoring connected devices is time-consuming and subject to human error. Each step of deployment adds to the cost of labor. Besides, given that this process is often driven by third-party installers and boots-on-the-ground technicians across the world, Wi-Fi credentials need to be shared broadly, which exposes retailers to potential Wi-Fi credential leaks.

## DESCRIPTION

This disclosure describes mechanisms for deploying connected and centrally-managed retail demo devices without requiring individual device setup in each retail location. The factory-to-shelf zero-configuration process allows devices to automatically connect to known retailer Wi-Fi networks and register with a centralized dashboard to enable retailer-specific content management, analytics, Over-the-Air (OTA) updates, and connected demo experiences.



**Fig. 1: Automatically connecting retail demo devices to store Wi-Fi**

Fig. 1 illustrates an example of connecting retail demo devices to store Wi-Fi networks at scale with zero in-store setup effort. Known Wi-Fi credentials, such as Wi-Fi network SSIDs, passwords, and the identity of the retailer associated with the network are provided to the device manufacturer. These credentials are stored in a Wi-Fi network configuration file (102) and included in the retail demo factory image of the device.

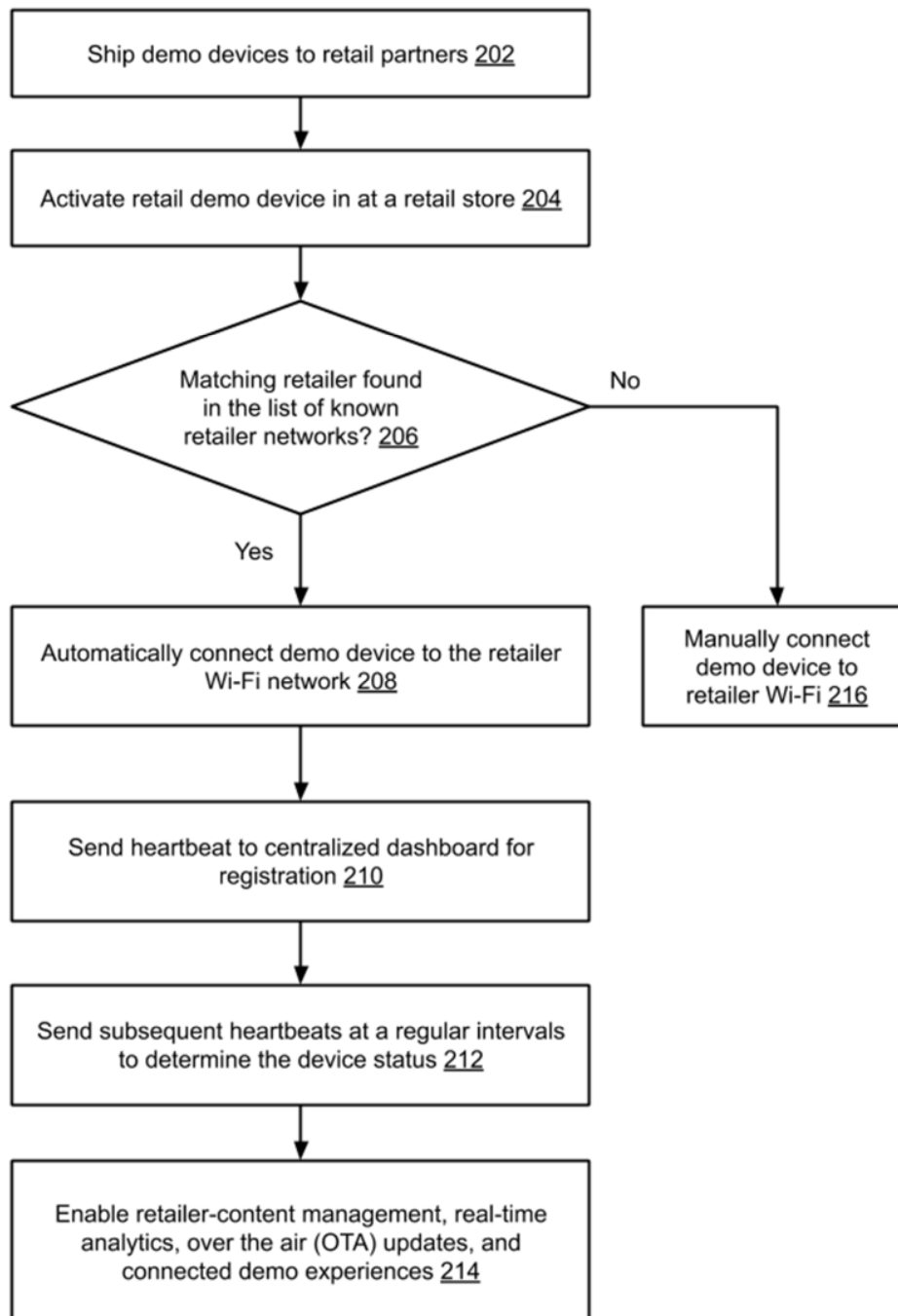
The configuration file is stored in a secure location on the retail demo devices (104). These devices are imaged with the factory image at the factory or other manufacturer facility (106). The retail demo devices are then shipped to retailers globally. To deploy a demo device, a retail associate or third-party vendor associated with a first retailer (108) unpacks a demo device, mounts it on a fixture, and powers it on. Upon startup, the device is configured to automatically

perform a scan of available Wi-Fi networks. If a known Wi-Fi network is found (associated with a retailer) is detected, the device automatically connects to the network and registers with a centralized dashboard (112), e.g., that may be hosted on a cloud.

Similarly, devices shipped to a second retailer (110), upon identification of a known Wi-Fi network, automatically connect to the second retailer's Wi-Fi and register themselves to the centralized dashboard. Thus, there is no need for store associates or third-party installers to manually configure a device or to know the retailer Wi-Fi network credentials. This reduces the manual effort to set up a demo device in store and the possibility of leak of Wi-Fi credentials.

Fig. 2 shows a diagrammatic representation of an example process associated with deploying retail demo devices without requiring manual device setup in each retail location. Retail demo devices with pre-registered Wi-Fi credentials included are shipped to retailer partners (202). For example, the credentials can be stored in a Wi-Fi network configuration file, which includes the known retailer Wi-Fi network service set identifiers (SSIDs), the retailer(s) associated with the Wi-Fi network, and passwords. The configuration file is stored in a secure location on the device and included in the retail demo factory image for the device. The retail demo devices are configured with the factory image at the factory or other manufacturer facility.

Upon receipt of the device, a retail associate or a third-party vendor activates a retail demo device in the store (204) by plugging it in. Upon startup, available public Wi-Fi networks are scanned (206). Upon detection of a known Wi-Fi network, as defined in the Wi-Fi network configuration file, the device automatically connects to the network (208). If verification of a Wi-Fi network fails, manual setup of the retail demo devices can be performed (216).



**Fig. 2: Example process for automatic factory-to-shelf connectivity for demo devices**

Once connected to the retailer Wi-Fi, the device sends a heartbeat to a centralized dashboard for registration (210). The heartbeat data can include a device serial number, product information, a demo content type and current version, retailer name, and store number. The

heartbeat data can also include location data. Location data can be obtained, e.g., via device GPS, by matching the retailer and store number to a list of known store locations, based on device IP address, etc.

Subsequent heartbeats are sent at a regular interval to indicate that the device is powered on, connected, and operating as expected (212). If no heartbeat is detected for a predetermined interval for a device, the device is considered offline. Once a retail demo device is registered with the centralized dashboard, a retail operations team can use the dashboard to troubleshoot issues in the field and dispatch boots-on-the-ground technicians to address issues. Furthermore, registering the retail demo devices to the centralized dashboard can also enable retailer-content management, real-time demo analytics, over-the-air (OTA) updates, and connected demo experiences (214).

Each demo device can be associated with a particular global retail partner location in any of the following ways. For devices that automatically connect to known retailer Wi-Fi networks, the associated retailer name is sent in the heartbeat request. Further, the device serial number in each heartbeat can be matched with shipment data to determine the exact location of the device, e.g., retailer and store number. Still further, for devices with GPS capability, latitude, and longitude information can be included in each heartbeat, further enabling the matching of device location to the nearest retail partner store location. Additionally, device IP address information can also be used to geolocate devices. Thus, the device location can be geolocated without the need for any manual configuration steps at a retail location.

The described techniques can also enable delivering content updates to connected retail demo devices. Content update requests may originate from the connected retail demo devices. The centralized dashboard can determine if a content update is available for a device based on

several parameters such as, e.g., device serial number, product information, demo content type, locale and current version, device software version, retailer name, and store number, etc.

Based on these parameters and server-side business logic, it is automatically determined if a content update is to be delivered to a retail demo device. The business logic evaluates the parameters, as mentioned above, along with retailer-specific restrictions on dates and times for delivering content updates. For example, updates can be restricted from being carried out on specific days (e.g., Black Friday) or during store open hours. Content managers can upload new content updates to the dashboard and specify the parameters for deployment. The updates may include support for a country, language, and retailer-specific content. Thus, content updates can be automatically made available to a fleet of retail demo devices.

Further, once retail demo devices are connected, demo interaction analytics can be transmitted to the centralized dashboard. This feature, combined with the content updates, enables a device manufacturer to A/B test retail demo content and optimize demo performance.

In addition to sending heartbeats and content update requests, the connected retail demo devices can also communicate with the manufacturer update server to determine if a device over-the-air (OTA) firmware update is available. Firmware updates can be issued automatically to fix software bugs or release new device features.

Thus, the techniques described herein enable easier and automated retail demo device configuration, including connection to a retailer network and centralized device monitoring and management. The connection can enable a more authentic product experience for the demo device by showcasing many features that require network connectivity. Delivering an authentic product experience in retail helps communicate all of the features of internet-connected devices



to potential customers. The described techniques ensure connectivity at scale, and elevate the product experience device-manufacturers can deliver to customers across partner retail locations.

## CONCLUSION

This disclosure describes mechanisms for automatically deploying connected and centrally-managed demo devices at retail locations. Wireless network credentials are pre-registered with a device manufacturer and included in a configuration file that is imaged onto a demo device. Upon power on, the demo device automatically searches for and connects to a retailer Wi-Fi network. The device sends heartbeats to a centralized dashboard to enable geolocation, monitoring and centralized management. The device can also transmit demo interaction analytics to the centralized dashboard.

## REFERENCES

1. <https://source.android.com/devices/tech/display/retail-mode>