QLIKTAG

How to Build a Product Authentication & Counterfeiting Detection Solution With THE QLIKTAG PLATFORM

V 1.0

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OVERVIEW

Counterfeiting continues to be a massive problem for consumer product companies across industry segments and geographies. Whether pharmaceutical products, luxury items, personal care & beauty, electronics or just about any product category. Counterfeiting contributes to massive revenue losses, loss of trust among consumers, brand value erosion and very often risks to the consumers and buyers of counterfeit items as well.

The primary issues has long been:

a. Detection & reporting of instances of counterfeit items
b. Ability of counterfeiters to outsmart anti-counterfeiting measures

Hologram stickers were introduced by several brands as an anti-counterfeiting solution assuming they would be difficult to replicate. Today, a hologram printer can replicate them for a few cents a piece. Hidden codes in packaging images and image detection based solutions allow the user to point a phone camera at the product packaging and identify certain image markers to ascertain if a product is genuine. However, counterfeiters are often resourceful and photograph the entire packaging and replicate them including the markers rendering this ineffective. QR-code based solutions and data matrix codes are also easy to photograph and replicate off one package and print for counterfeits. Most solutions offered today have loop holes counterfeiters are able to exploit.

THE CONNECTED SMART PRODUCTS APPROACH TO A SOLUTION

One of the key advantages of using the QLIKTAG Connected Smart Products Platform is the ability to easily serialize and identify every instance of your product with a digital twin created on the platform. While serialization has been somewhat restricted to electronics, pharmaceutical, healthcare devices and similar industries, with the QLIKTAG Platform, any category of products can be digitally serialized, stored against the digital twin and identified individually with a QLIKTAG. This would allow for authentication of your product at an individual serial instance instead of at a SKU level giving you more granular data insights.

The second critical part of this approach is the use of a “Trusted NFC” sticker or packaging insert. A standard NFC sticker when tapped would be identified by a fixed NFC identifier embedded within the sticker. However, that is possible to replicate and if a counterfeiter can get the identifier off one NFC sticker, they can use that to configure others. However, a Trusted NFC sticker or insert generates a new key real-time on every tap which will be authenticated against the server record at that moment in time making it impossible to replicate.

When a consumer or a partner within your supply chain uses their NFC enabled smartphone to tap the product, the Trusted NFC equipped packaging will return a URL for that products digital twin on the QLIKTAG Platform along with an authentication key generated for that tap and valid for a short time period only. Along with this other data such as location, IP, user information and more can also be appended to the request. If authenticated, the server will send back a success notification communicating to the user the product is authentic. If the authentication request fails, an email alert can be triggered with details and a log can be maintained with the ID of the product, batch it belonged to, location co-ordinates of the failed authentication attempt and other data. While building a solution like this, a dashboard map can be created with instances of these logged failures to spot multiple instances of failed authentication happening within specific locations so they can be investigated. If a few failure instances pop up, they can be ignored. However if there’s a trend of multiple authentication failures appearing on a part of the map, it could indicate a counterfeiting problem in that area that needs to be looked into.

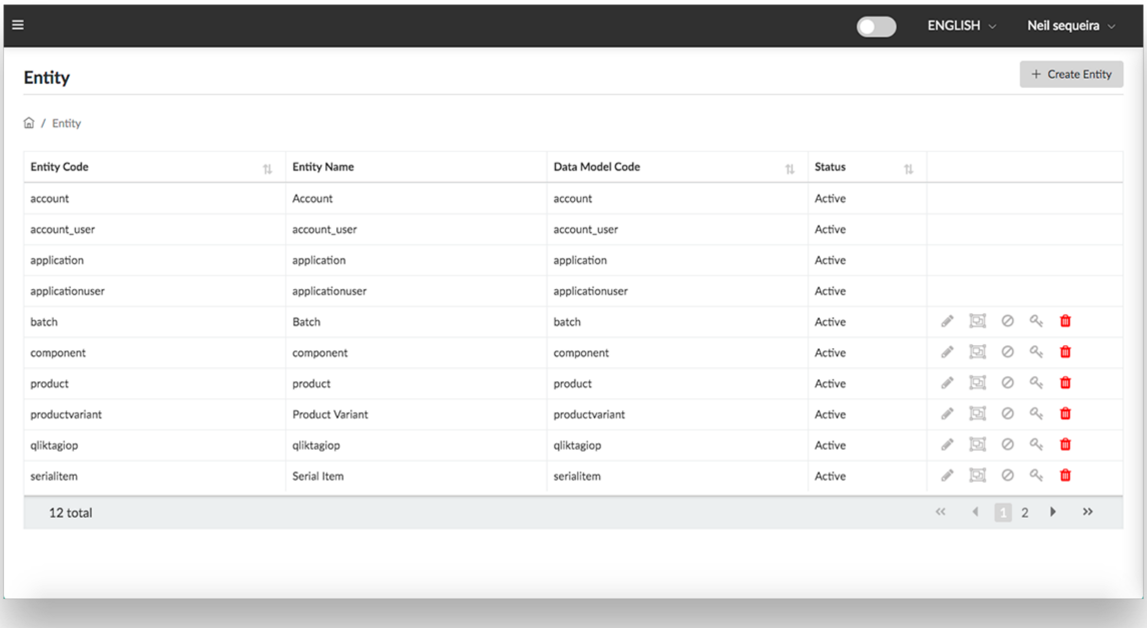
CONFIGURING THE QLIKTAG PLATFORM

For this solution, the main entities for which digital twins were maintained are: **Batch**, **Product SKU**, **Product Serial Item** and **TrackLog**. Tracklog is a distinct, stand-alone entity which records all business transactions against each Batch or individual Serial Item. It is set up separately and associated with the Batch & Serial Item entities.

1. Configure Your Entities & Data Models

Ideally for this solution, the main entities for which digital twins can maintained for this solution are:

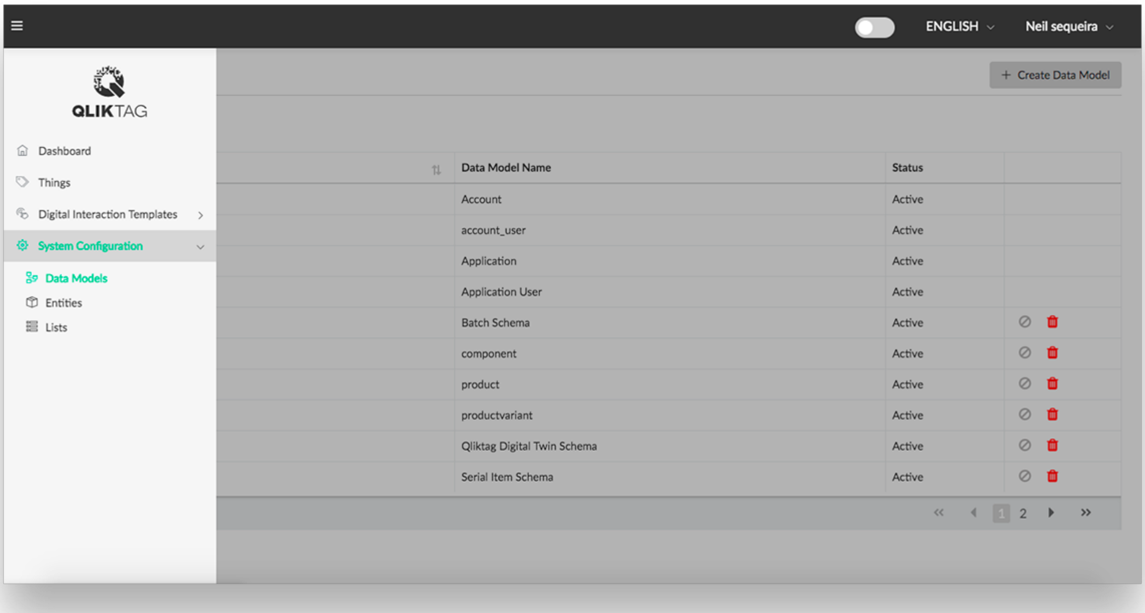
a. **Product Batch**
b. **Product SKU**
c. **Product Serial**



Entity Code	Entity Name	Data Model Code	Status	
account	Account	account	Active	
account_user	account_user	account_user	Active	
application	application	application	Active	
applicationuser	applicationuser	applicationuser	Active	
batch	Batch	batch	Active	
component	component	component	Active	
product	product	product	Active	
productvariant	Product Variant	productvariant	Active	
qliktagiop	qliktagiop	qliktagiop	Active	
serialitem	Serial Item	serialitem	Active	

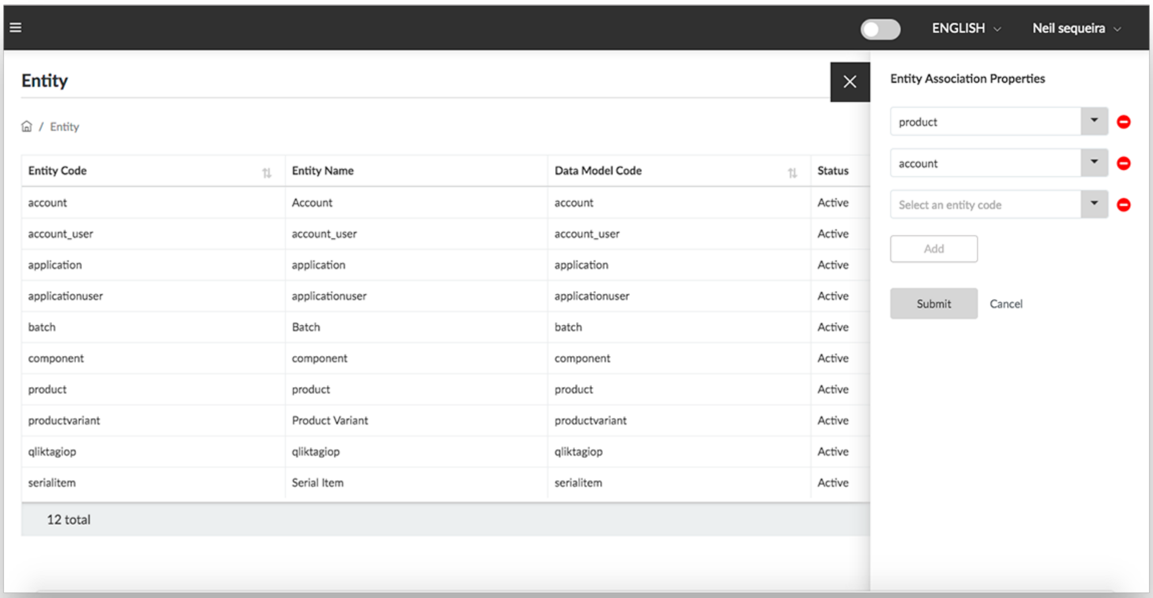
12 total

Under the **‘System Configuration’** section, select **‘Data Models’** and either **‘Add’** and use the drag & drop designer to design your own data models for these 3 entities or select & modify from the library of pre-loaded data models available for products.



Data Model Name	Status
Account	Active
account_user	Active
Application	Active
Application User	Active
Batch Schema	Active
component	Active
product	Active
productvariant	Active
Qliktag Digital Twin Schema	Active
Serial Item Schema	Active

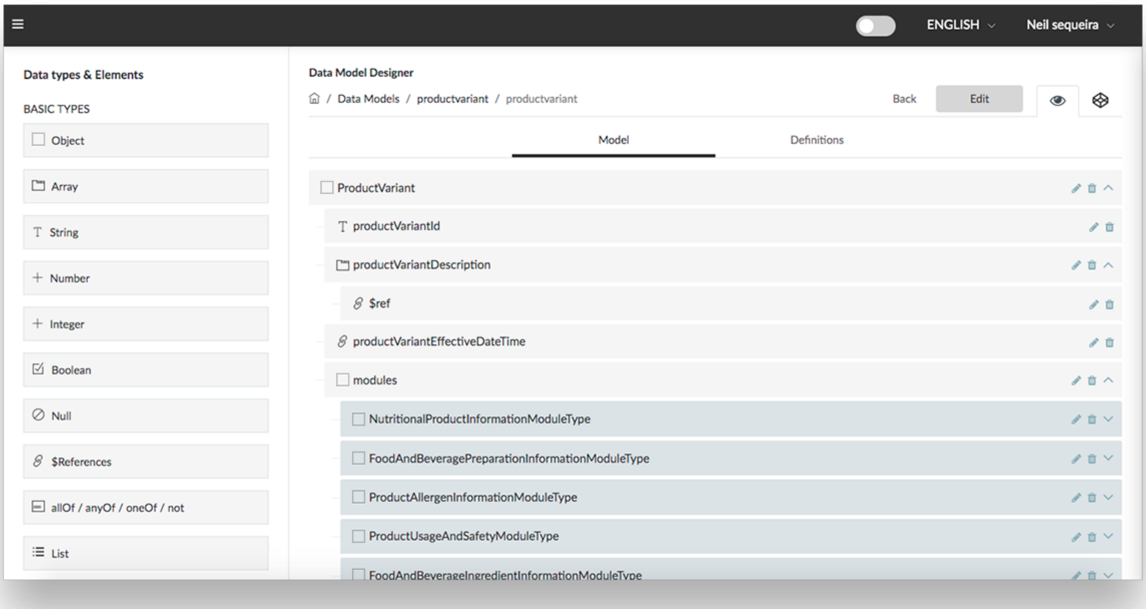
Once your data models have been finalized, under the **‘Entities’** section, create the 3 entities selecting the correct “Data Model” to be assigned for each before saving and activating these entities. In order to structure the dependencies so that a Product Serial belongs to a Product SKU and a Product SKU can only exist under a Product Batch, select the **‘Set Entity Associations’** section and define these dependencies.



Entity Code	Entity Name	Data Model Code	Status
account	Account	account	Active
account_user	account_user	account_user	Active
application	application	application	Active
applicationuser	applicationuser	applicationuser	Active
batch	Batch	batch	Active
component	component	component	Active
product	product	product	Active
productvariant	Product Variant	productvariant	Active
qliktagiop	qliktagiop	qliktagiop	Active
serialitem	Serial Item	serialitem	Active

12 total

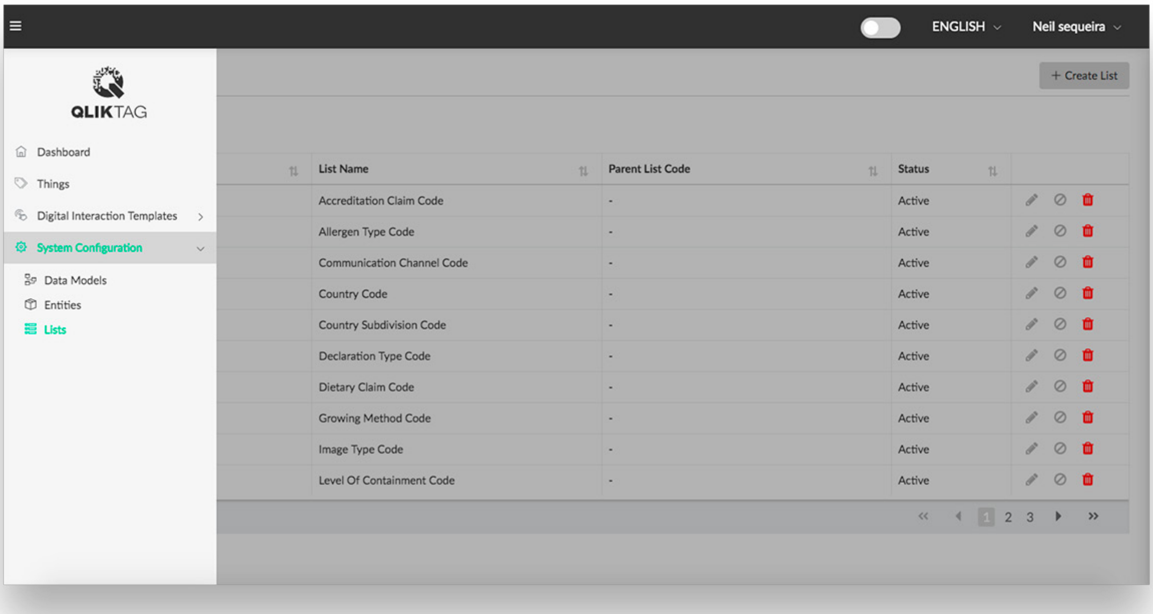
Entity Association Properties: product; account; Select an entity code



- ProductVariant
  - productVariantId
  - productVariantDescription
    - $ref
  - productVariantEffectiveDateTime
  - modules
    - NutritionalProductInformationModuleType
    - FoodAndBeveragePreparationInformationModuleType
    - ProductAllergenInformationModuleType
    - ProductUsageAndSafetyModuleType
    - FoodAndBeverageIngredientInformationModuleType

2. Completing Configuration

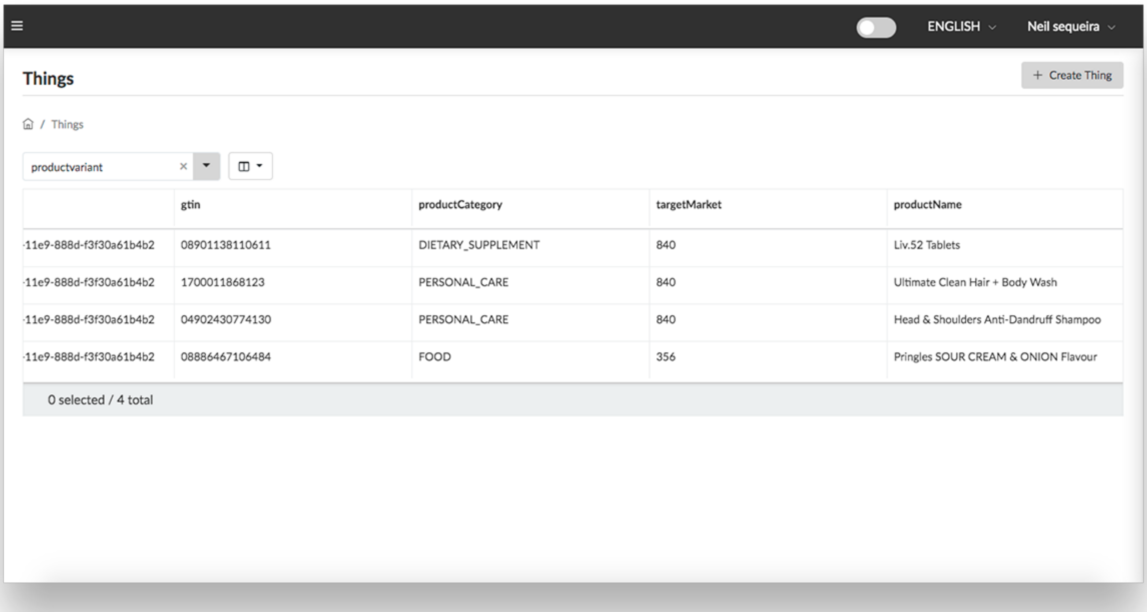
In order to complete the configuration of your products as "Connected Things", you can configure **'Rules & Validations'**, **'Lists'** of values that may be referred to by attributes within your data models and **'User Roles & Permissions'** for colleagues and other users you may want to provide access for within the platform. Finally, you may choose to customize the **'Views'** or user interface screens that will allow you to view and edit your product instances within the platform.



List Name	Parent List Code	Status
Accreditation Claim Code	-	Active
Allergen Type Code	-	Active
Communication Channel Code	-	Active
Country Code	-	Active
Country Subdivision Code	-	Active
Declaration Type Code	-	Active
Dietary Claim Code	-	Active
Growing Method Code	-	Active
Image Type Code	-	Active
Level Of Containment Code	-	Active

3. Process for Creation of Digital Instances

Once your Entities & System have been configured, you can design a process for creating Digital Instances for each item you manufacture and send to market within the QLIKTAG Platform. All required platform APIs are available to integrate your processes and other systems to ensure a new digital instance is created each time a new batch or serial instance of a product is manufactured or ready to go to market.



Things

/ Things

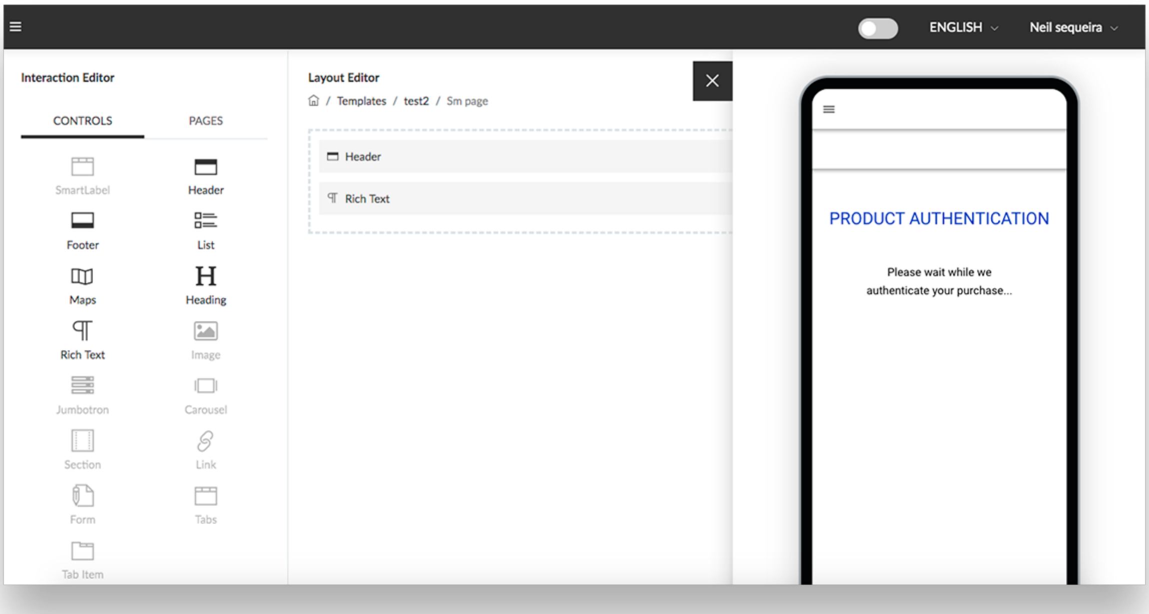
productvariant

	gtin	productCategory	targetMarket	productName
-11e9-888d-f3f30a61b4b2	08901138110611	DIETARY_SUPPLEMENT	840	Liv.52 Tablets
-11e9-888d-f3f30a61b4b2	1700011868123	PERSONAL_CARE	840	Ultimate Clean Hair + Body Wash
-11e9-888d-f3f30a61b4b2	04902430774130	PERSONAL_CARE	840	Head & Shoulders Anti-Dandruff Shampoo
-11e9-888d-f3f30a61b4b2	08886467106484	FOOD	356	Pringles SOUR CREAM & ONION Flavour

0 selected / 4 total

4. Design Digital Interactions to Display a Post Authentication Product Experience

The "Digital Interaction Editor" can be used to design a post-authentication landing page for the product which loads after a successful authentication and offers some product information and an experience to the consumer. The design could include product specific or batch specific content such as images, product instructions, suggestions, use by date or simply a thank you note to the user for taking the time to authenticate their purchase. Similarly, a second interaction can be designed to show up on a failed request warning the user that the product they tapped has failed the authentication test and may be a counterfeit. The interaction design can include a form for the user to report the product and submit details of the product, where they found it, where it was purchased, what it looks like and information that can help investigate a potential counterfeit.



PRODUCT AUTHENTICATION

Please wait while we authenticate your purchase...

5. Process for Including Trusted NFC Stickers or Inserts

A “Trusted NFC” sticker or packaging insert would have to be added to the product packaging which is capable of sending the product URL along with the dynamically generated key which changes on every tap. Please contact info@qliktag.com to request more information on these “Trusted NFC” tags if you would like us to connect you to our partner company that manufacturers them.

The URL generated by the Trusted NFC would look like this:

http://a.qlkt.ag/ik?tagID=11006050&amp;tac=98B94C21AEF4DB3794B-83D6A69D1EF568C0E0C43

Note: *This key is generated by the Trusted NFC sticker real-time, changes with each tap and only valid for a short duration. It can't be replicated.*

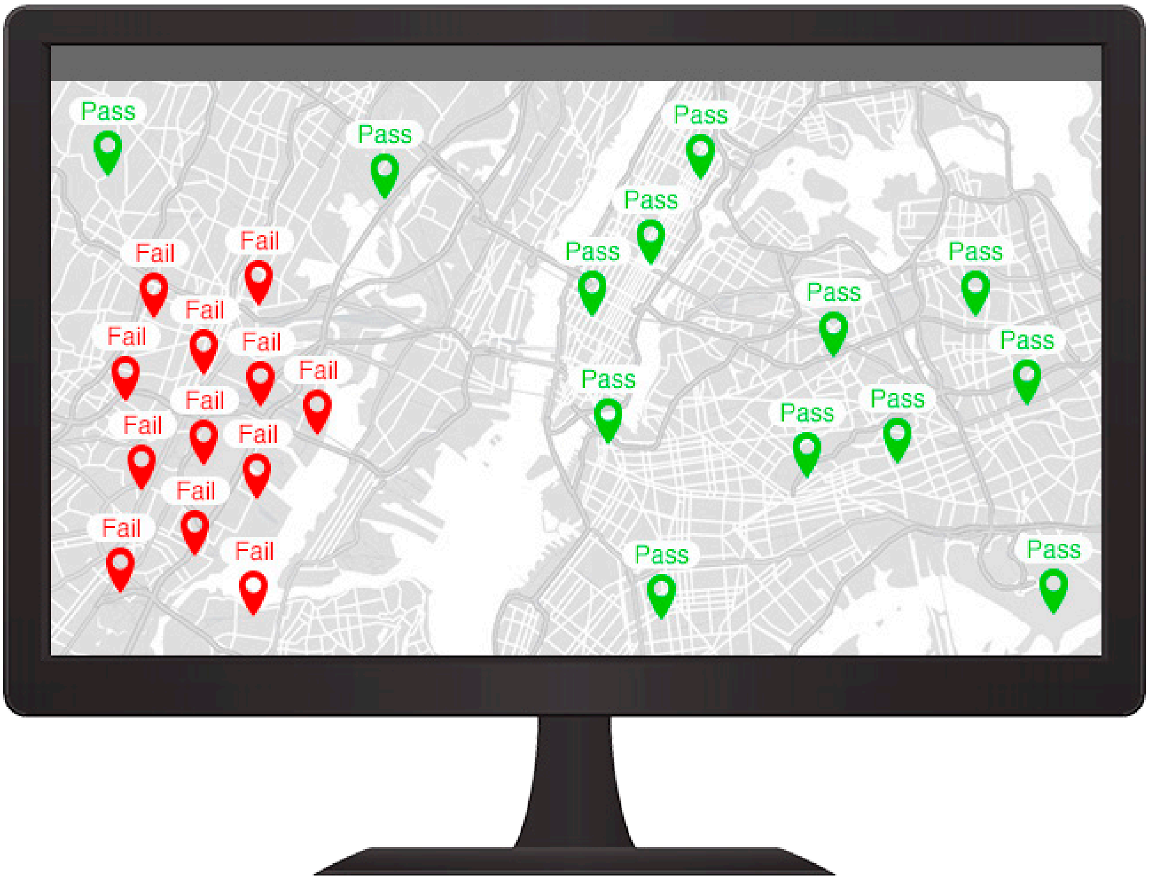
tac=98B94C21AEF4DB3794B83D6A69D1EF568C0E0C43

6. Authentication of the Request

When the Trusted NFC is tapped a request will be sent to the authentication server which runs a check of the dynamically generated key on the product Trusted NFC tag end against the key simultaneously generated on the server, authenticate it and return a pass or failed message back to the user and app.

7. Analysis of the Data

As users are tapping the products, user details, device details, location, IP and other data can also be sent appended to the URL request. A log of successfully authenticated requests and failed requests can be logged by developing your solution on top of the QLIKTAG Platform APIs. You may choose to send email alerts of failed requests to certain people within the organization or plot them on a geographical map to create a dashboard to see trends of failures develop in specific locations.



Conclusion

This document serves only as an example of how an intelligent authentication and anti-counterfeiting solution can be built by enabling your products as connected smart products using the QLIKTAG Platform. With the use of Trusted NFC stickers and inlays which generate real-time keys that are impossible to replicate and using the QLIKTAG Platform to enable your products to maintain a digital instance of themselves over the internet, the guidelines can help the products deliver critical information about themselves and develop a robust solution to detect and curb counterfeiting.