Why join this virtual experience program?

Welcome to Visa Token Service Technology Virtual Experience Program! We are so excited to have you here!

As the world's leader in digital payments technology, Visa's mission is to connect the world through the most creative, reliable and secure payment network - enabling individuals, businesses, and economies to thrive. The Visa Token Service is a security technology that replaces sensitive payment account information found on payment cards, such as the 16-digit account number, expiration date, and security code, with a unique digital identifier that can be used to process payments without exposing actual account details. Token service allows financial institutions, merchants, and value-added partners to develop new payment and commerce platforms.

During this program, you will get the opportunity to step into the shoes of a Visa team member and complete tasks that replicate the work that our software development team does every day. You'll learn how to confirm the validity of an incoming Visa transaction request and determine how Visa APIs solve an array of cardholders' matters.

We hope this program provides a great resource for you to up-skill and strengthen your resume as you explore career options and a potential career at Visa!

There are 2 tasks for this program:

- Card Authentication
- Select Visa API for Use Cases

Visa Token Service Technology Virtual Experience Program
how to confirm the validity of an incoming Visa transaction request and determine how Visa APIs solve an array of cardholders' matters.
Software development in Visas APIs and tools for digital commerce , tokenization services
Task : receive an incoming transaction request from a customer. I write a code to interact with visa token services and authenticate whether the card is valid

Brighid Jensen (GLoobal head of early careers recruiting program- Visa)

What is Visa Token Service Technology?

Let's first think about how you **purchase things online**. You might have your card details saved with certain sites, or you might choose to enter your 16 digit card number each time you buy something.

Well, every time you make a purchase - the business or 'merchant' that you are buying from has to check:

- if the online transaction is valid, and
- if your card information needs to be updated.

As online marketplaces continue to grow there is a need to:

- **Simplify** and **speed up** the process for **businesses** to validate transactions and check card details.
- Ensure greater **security** for **consumers** (like yourself) as they store their card details across platforms

So, what is Visa Token Service?

To help with the above needs and as a leader in online payments, Visa is simplifying the process using a **Visa Token Service.**

"VTS is a new security technology that replaces sensitive account information, such as the 16-digit primary account number, with a unique digital identifier called a **token.**

The token allows payments to be processed without exposing actual account details." Source: Visa

Okay, great! Now you have a bit of background, complete the knowledge check quiz and continue to the task.

Your task is to confirm if a card is valid

In this task, you'll be working as a developer on Visa's VTS team. Your job is to confirm whether a card is valid before it can be charged for a transaction.

To do this:

1. You'll write **code** to send a request to the Card on File Data API - this is a subset of Visa Token Services.
2. Once you send your request - you'll receive data confirming whether the card is valid.

Note: You can write your solution in the language of your choice, but the model answer will be in Python.

Move on to the next step when you're ready.

Sub Task 1: Project Configuration

As we mentioned - your first step is to write **code** to send a request to the Card on File Data API.

In order to send this request, you'll first need to configure your workspace so that you are authorized to use the Visa API.

Step 1: Start by setting up a free Visa Developer account. This allows you to access the API for this task.

Step 2: Verify your email and login to your developer account.

Step 3: On the Visa Developer Dashboard, select *Add a New Project*.

Step 4: Give your project a name of your choice.

Step 5: Under *Select APIs*, check *Card on File Data Inquiry*.

Step 6: The remaining options can be left at their default values – Under *Select Authentication*, *Mutual Authentication* should be checked and under *Submit a Certificate Signing Request*, *Generate a CSR for Me* should be selected.

Step 7: Click *Create Project* to register your project.

Step 8: Save your certificate private key locally. Note that this key cannot be retrieved later!

Sub Task 1: Project configuration (continued)

Now that you've saved your key, take the following steps to finish off your project configuration.

Step 9: Follow the steps listed here to configure your workspace to use a two-way SSL keystore to validate your identity so that you can access the API.

Step 10: Once you've configured your workspace, navigate to the Project Dashboard and consider trying out the Hello World Sample Codes under General Assets -> Sample Code. While optional, this can help you to ensure that your certificates are configured correctly!

How to configure your workspace to use a two-way SSL keystore to validate your identity so that you can access the API?

https://developer.visa.com/pages/working-with-visa-apis/two-way-ssl#configuring_a_twoway_ssl_keystore_using_an_autogenerated_csr

User ID: DQFQ3LD8PZW2FZ6MHCD721POtavuCke6avwdU72pujuE4Eceg

Password : XvI0c72e82rdLDwZW9r8Z1m737878g7sOxu

Sub Task 2: Authenticating a Transaction

Great work configuring your project!

Now you will use the Visa API to **authenticate a transaction** to check that the card is valid.

The following resources will help you learn more about Visa Token Services and the Card on File API:

- Python Requests
- JavaScript Requests

To authenticate the transaction, take the following steps:

Step 1: Review the *Card on Data File API* documentation.

Step 2: The API documentation provides a sample request. This is the request you'll be validating:

```
{
   "requestHeader":{
      "requestMessageId":"6da6b8b024532a2e0eacb1af58581",
      "messageDateTime":"2019-02-35 05:25:12.327"
   },
   "requestData":{
      "pANs":[
         4072208010000000
      ],
      "group":"STANDARD"
   }
}
```

Step 3: Locate the address of Visa's sandbox server in this documentation. This is the address to which you'll be sending your request.

Step 4: Create a script that sends a request with the above data to Visa's sandbox server. You can write your solution in the language of your choice. Just note that the Visa employee's example answer you unlock after the task is written in Python.

That's it! Submit your script file as your deliverable for this task.

Estimated time for task completion: 1-1.5 hours depending on your learning style.

T1:
LEARNED (confirm whether a card is valid before it can be charged for a transaction, write **code** to send a request to the Card on File Data API - this is a subset of Visa Token Services, Once you send your request - you'll receive data confirming whether the card is valid. Get

familiar to the Visa Developer center, establish a Two-Way SSL (Mutual Authentication) connection
)

Here is the background information on your task

In task 1 you learned about VTS and using Visa's Card on File Data API.

In this task, you'll learn about different APIs offered by VisaNet.

So what is VisaNet?

VisaNet is one of the world's largest electronic payment networks, connecting people, companies, and governments across 200 countries and territories. It's designed to:

- provide risk management and information services,
- allow people to transfer money quickly and securely, and
- facilitate transactions between consumers, businesses, and governments, making it a great solution for a wide variety of digital payments.

How can VisaNet help?

When developing new software features, you often have to choose the best tool to solve a given problem. You'll frequently explore documentation to determine what tools are available and which are best suited for the challenges at hand. VisaNet, for example, offers numerous APIs that are applicable across a wide variety of use cases.

In this task you will:

1. Consider some challenges that could be solved using VisaNet.
2. Review the VisaNet documentation to identify the API best suited to address the challenge.
3. Write up an explanation describing why that API is an appropriate choice.

Now you have the context - click next to move onto your task.

Here is your task

As a software developer working with the Visa API, you will explore the documentation to select the best API to solve a given problem. You can exclude restricted APIs from your options since their documentation is not publicly available.

First of all, review the following Visa documentation:

- VisaNet
- Visa API Documentation
- Visa API Use Cases

You will use this documentation to select the best API for the use-cases provided.

Select the API that is the best fit for the problem

For each of the four use cases below, find an API from the list of Visa APIs that would be a good fit for the problem.

Case 1: Your company would like to provide a discount to customers who pay for a product using a Visa Signature card in the United States. (discount for US customers paying via Visa signature card)

Case 2: A company wants to register a portfolio of cards at your financial institution so that all its business accounts are managed in one place. (portfolio of cards for managing business at one place)

Case 3: Clients at your financial institution often contact customer service because they don't recognize the transactions that appear on their cards, even if these transactions are valid. Your company wants to provide its clients with cleaner, easier-to-read transaction histories. (Well read transaction histories for poor ones)

Case 4: Even after providing clients with cleaner merchant names, your financial institution still receives disputes of valid transactions. To reduce the rates of disputes, you'd like to provide customers with a way to retrieve additional information about their purchases. (additional purchase info reducing transactions disputes)

The list of Visa APIs are found in the link provided:

- Visa API Documentation

Once you've evaluated the use cases & selected the appropriate API, it's time to describe why you selected it.

For each use case outline which API you select to use and why

Briefly describe which API you selected for each use case and why you thought it is a good fit for the problem. This will be your deliverable for this task. Your response should be approximately 200-300 words in length.

Estimated time for task completion: 1-1.5 hours depending on your learning style.

For ease of reference, the use cases are listed again below:

Case 1: Your company would like to provide a discount to customers who pay for a product using a Visa Signature card in the United States.

Case 2: A company wants to register a portfolio of cards at your financial institution so that all its business accounts are managed in one place.

Case 3: Clients at your financial institution often contact customer service because they don't recognize the transactions that appear on their cards, even if these transactions are valid. Your company wants to provide its clients with cleaner, easier-to-read transaction histories.

Case 4: Even after providing clients with cleaner merchant names, your financial institution still receives disputes of valid transactions. To reduce the rates of disputes, you'd like to provide customers with a way to retrieve additional information about their purchases.

1. Visa Merchant Offers Resource Center (VMORC) will be a good API for case 1 because it provides approved and active offers specific to a user account. Offers in the VMORC APIs contain a set of required and optional fields so we can check our two requirements: 1. The payment is done using a Visa Signature card and can be checked by card payment types 2. The transaction happening in the US can be checked using the promoting countries option. This API is available worldwide as well.
2. Visa B2B Payment Controls will be a good fit for case 2 as it sets controls on B2B card portfolios of client companies. It can provide a set of endpoints to achieve the desired use case. In addition ongoing management and rule setting capabilities can be used as well. This API helps setting up a company and card portfolio first. And then management and rule settings can be used according to the desired choice of companies.
3. Visa Business Data Solutions will be a perfect API for case 3 as it provides a faster and more efficient way for participating issuers and their commercial clients to pull their commercial transaction data and make strategic decisions based on data-driven insights. It also provides access to transaction and enhanced data along with Supplier data via different data groupings. In addition this API is available worldwide.
4. Visa BIN Attribute Sharing Service (VBASS) will be a good API for case 4 as it enables sharing of Visa BIN data with merchants and other entities to help improve authorization rates, reduce fraud and improve the general checkout experience. Full BIN List, Single BIN Lookup, BIN Files Metadata and BIN File Transfer APIs are available using it. It is also available worldwide.

Getting Started with Visa Merchant Offers Resource Center

About Visa Merchant Offers Resource Center

The Visa Merchant Offers Resource Center (VMORC) provides approved and active offers specific to a user account. All functions supported by the VMORC APIs are READ-ONLY. All responses are returned in a JSON format.

Things to Know

Offers in the VMORC APIs contain a set of required and optional fields. The following fields are required from each VMORC offer:

Getting Started with Visa B2B Payment Controls

About Visa B2B Payment Controls

We look forward to working with you as you leverage Visa B2B Payment Controls to set controls on your B2B card portfolios. You can select what you need from our set of endpoints to achieve your desired use case. Some of these endpoints are required because they are pivotal to the functionality of the API whereas some may be optional.

The overall flow of the service includes setting up your company and card portfolio first. After you are all set up, you will use the ongoing management and rule setting capabilities.

The Visa B2B Payment Controls APIs are grouped into 5 different services: Company Management, Account Administration, Controls Management, Contact Management, and Reporting Management. See the How to Use Visa B2B Payment Controls page to see more information. You can perform the different operations related to each service including: create, update, delete, and get to retrieve existing information. We will work with you during implementation process to select the configuration that best meets your use case as well as complete the standard system-readiness tasks needed before you use Visa B2B Payment Controls. https://developer.visa.com/capabilities/visa-b2b-payment-controls/docs

Getting Started with Visa Business Data Solutions

About Visa Business Data Solutions

The Visa Business Data Solutions API provides a faster and more efficient way for participating issuers and their commercial clients to pull their commercial transaction data and make strategic decisions based on data-driven insights. Current APIs provide access to transaction and enhanced data along with Supplier data via different data groupings. Access is subject to Visa approval and

subject to applicable terms and conditions. There is an Issuer subscription process to access the relevant data using APIs.

Clients using the API can easily:

- Pull both transaction and enhanced transaction data—including Supplier data when available.
- Group transaction data at different levels, such as Corporate or FI.
- Pull all or specific transaction data elements.
- Integrate with downstream endpoints including third-party reporting and financial systems.

Things to Know

The Business Data Solutions APIs can be used by Issuers, their Corporates and with Visa and Issuer approval, third-party reporting system service providers, to access the commercial card data. Data can be accessed based on the Issuer subscription process. Visa representatives can help with the subscription process.

Getting Started with Visa BIN Attribute Sharing Service

About Visa BIN Attribute Sharing Service

Visa's BIN Attribute Sharing Service (VBASS) is an optional service that enables sharing of Visa BIN data with merchants and other entities to help improve authorization rates, reduce fraud and improve the general checkout experience.

As a part of VBASS, the Full BIN List, Single BIN Lookup, BIN Files Metadata and BIN File Transfer APIs are available to all developers in the Sandbox. Visa requires all recipients of the BIN attribute data, register and be billed for the service. Visa licensed acquirer or issuer can register an entity to participate into VBASS program. Except as otherwise agreed upon by Visa, participation is further subject to agreement to the VBASS specific terms, as well as Visa approval. A detailed overview of additional requirements, participation criteria, billing and exceptions can be found on Visa Online.

Visa retains the right to review your project's implementation of these APIs before on-boarding to ensure that they are being used appropriately.

SAMPLE WORK

Case 1: Your company would like to provide a discount to customers who pay for a product using a Visa Signature card in the United States.

For this use case, you can use the Visa Card Eligibility Service API. The Visa Card Eligibility Service checks whether a card is eligible for a given promotion and returns the appropriate card details. Eligibility can be determined by a variety of compounded rules, such as a region, card type, reward programming enrollment, and spending history.

Case 2: A company wants to register a portfolio of cards at your financial institution so that all its business accounts are managed in one place.

To register a portfolio of cards, you can use Via B2B Payment Controls API. To use this API, you first add an individual company and then register their cards as needed. This portfolio allows you to set up controls across various accounts.

Case 3: Clients at your financial institution often contact customer service because they don’t recognize the transactions that appear on their cards, even if these

transactions are valid. Your company wants to provide its clients with cleaner, easier-to-read transaction histories.

To provide clients with cleaner merchant names, you can use the Merchant Search API. Visa's Merchant Search API allows users to search for readable merchant names based on the provided merchant name or other identifying attributes. If the entire merchant name is not provided by the source, it can also use wildcard sources to identify the best guess.

Case 4: Even after providing clients with cleaner merchant names, your financial institution still receives disputes of valid transactions. To reduce the rates of disputes, you'd like to provide customers with a way to retrieve additional information about their purchases.

You can use the Visa Cardholder Purchase Inquiry to provide clients with more information about their purchases. This service is a composite of two APIs, the SICardholderPurchaseInquiry and the SIGetCardholderPurchaseInquiry APIs, both of which return detailed information about a transaction. While SICardholderPurchaseInquiry acquires data based on the transaction's VisaNet data, SIGetCardholderPurchaseInquiry acquires information based on the transaction ID. These two APIs can provide customers with additional information about their purchases, making them less likely to file disputes.

Getting Started with Visa Card Eligibility Service

About Visa Card Eligibility Service

The Visa Card Eligibility Service (VCES) APIs can be used in sandbox by any developer.

The sandbox includes an environment and test data to enable using the API for testing. For more details, please reach out to developer@visa.com.

All projects using VCES will go through a review and approval process at Visa. Please reach out to your Visa account representative early in the process to ensure that your application meets the criteria permitted for the use of VCES.

The service provides two APIs. The *Visa Card Eligibility API* could be used by partners who have access to the cardnumber as part of the usecase. Partners who do not have access to the cardnumber could use the *Visa Card Eligibility iFrame API* to check for eligibility.

Getting Started with Card-On-File Data Inquiry

About Card-On-File Data Inquiry.

Consumers are storing their card credentials at more online retailers and service providers, but often lack visibility into which merchants have their card information and where the card information needs to be updated, when the card is reissued.

Things to Know

A suite of technologies that bundles both new and existing Visa capabilities that allow a consumer to add, view and manage their Visa card through their Issuer’s online and mobile channels.

Transactions are either initiated by a consumer, or by a merchant based on the instructions given to them by the consumer. Based on those instructions, it is possible for a merchant to initiate a transaction without consumer action.

Getting Started with Visa Supplier Matching Service

About Visa Supplier Matching Service

The Visa Supplier Matching Service is the fast, efficient way to identify suppliers that accept Visa Commercial payment products, so you can reduce time-consuming and labor-intensive paper-based invoice processing and check writing.

The *Visa Supplier Matching Service APIs* allow users to identify suppliers that accept Visa Commercial Payment Products by matching an organization's supplier data against the Visa commercial merchant database. For example, you can send supplier data and learn whether that supplier has accepted a commercial card transaction and they pass Level II and III enhanced data as well as obtain their merchant category code (MCC).

Getting Started with Visa B2B Connect

Things to Know

The Visa B2B Connect APIs can be used in the sandbox by any developer with a registration and upon acceptance of terms and conditions. The sandbox does not have Visa network connectivity, so validating the receipt of a pull funds, push funds, or reverse funds transfer cannot occur in the sandbox.

1. Commercial Customer A initiates a payment funded from their account at Bank A.
2. Bank A (Originating Bank) submits the payment instruction to the Visa B2B Connect Service.
3. Bank A funds Visa's settlement accounts in settlement currency before the close of the settlement window.
4. Visa B2B Connect validates the transaction and cofirms with the Originating Bank.
5. Visa B2B Connect notifies Bank B (Beneficiary Bank) by sending a payment remittance notification.
6. Visa B2B Connect delivers payment to Bank B. Note: Beneficiary Bank may use finds as liquidity on the Visa B2B Connect network.

Merchant Card Portfolio means contracts with merchants to provide electronic credit and/or debit card authorization and payment processing systems and services.

https://www.lawinsider.com/dictionary/merchant-card-portfolio

Congratulations on completing Task 2: Select Visa API for Use Cases!

By completing that task, you were exposed to the following 2 skills:

In the next task, you will be exposed to the following 2 skills:

HTML Requests
Visa API

About VISA
https://usa.visa.com/dam/VCOM/global/about-visa/documents/visanet-factsheet.pdf
Card on file Data API
https://usa.visa.com/content/dam/VCOM/global/products/documents/visa-vts-card-on-file-fact-sheet.pdf