Treasury and Trade Solutions

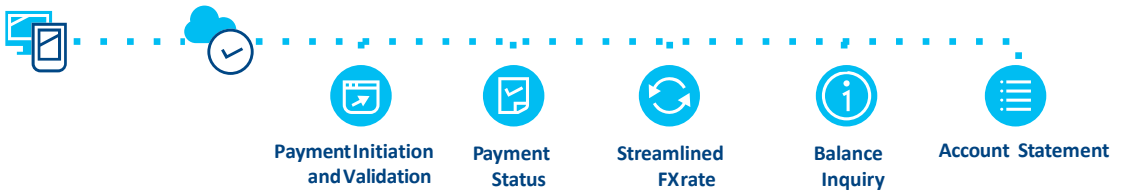
CitiConnect API – Clearing and Cross Border Payments for Banks

Real-Time Connectivity in the World of Digital Finance

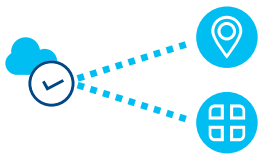
CitiConnect API

Application Programming Interface (API) is the primary entry point into Citi whether it is called from a company's own application or vendor application. API enables nimble interactions in digital ecosystems.

CitiConnect® API allows Citi to expose a menu of TTS products and services through direct integration with Treasury Workstations (TWS), Enterprise Resource Planning (ERP) platforms, or other online applications.



CitiConnect® API Developer Portal helps Accelerate implementation and go live faster by easily accessing the latest information and performing technical testing upfront.



Online Repository - One place to access the latest documentation and information on APIs any time you need it.
Sandbox Environment - Test APIs even before accounts are available, resulting in higher quality releases and less rework.

Key Benefits

Provide flexibility
and choice to consume financial services as desired and needed

Accelerate client implementations
by simplifying integration and reducing onboarding time

Next-generation client experience
by providing an API onboarding portal and facilitating access to banking servies

What is OAUTH 2.0 and Why it is Important in API Setup?

- It supplies the authorization workflow for web, desktop applications, and mobile devices.
- OAuth 2.0, which stands for “Open Authorization”, is a standard designed to allow a website or application to access resources hosted by other web apps on behalf of a user. It replaced OAuth 1.0 in 2012 and is now the de facto industry standard for online authorization. OAuth 2.0 provides consented access and restricts actions of what the client app can perform on resources on behalf of the user, without ever sharing the user's credentials.
- OAuth 2.0 is an authorization protocol and NOT an authentication protocol. As such, it is designed primarily as a means of granting access to a set of resources, for example, remote APIs or user’s data.
- OAuth 2.0 uses Access Tokens. An Access Token is a piece of data that represents the authorization to access resources on behalf of the end-user.
- OAuth 2.0 doesn’t define a specific format for Access Tokens. However, in some contexts, the JSON Web Token (JWT) format is often used. This enables token issuers to include data in the token itself. Also, for security reasons, Access Tokens may have an expiration date.

Certificates for Consideration

- Trusted Authorities: Citi API does not support self-signed certificates; your organization should procure and own the certificates. Citi API uses the trusted certificate authorities as below, Contact your Implementation Manager to support any other trusted CA which is not listed here.
- Verisign
- Symantec
- Equifax
- Comodo
- Thawte
- Entrust
- Go Daddy
- Geo Trust
- DigiCert
- Global Sign

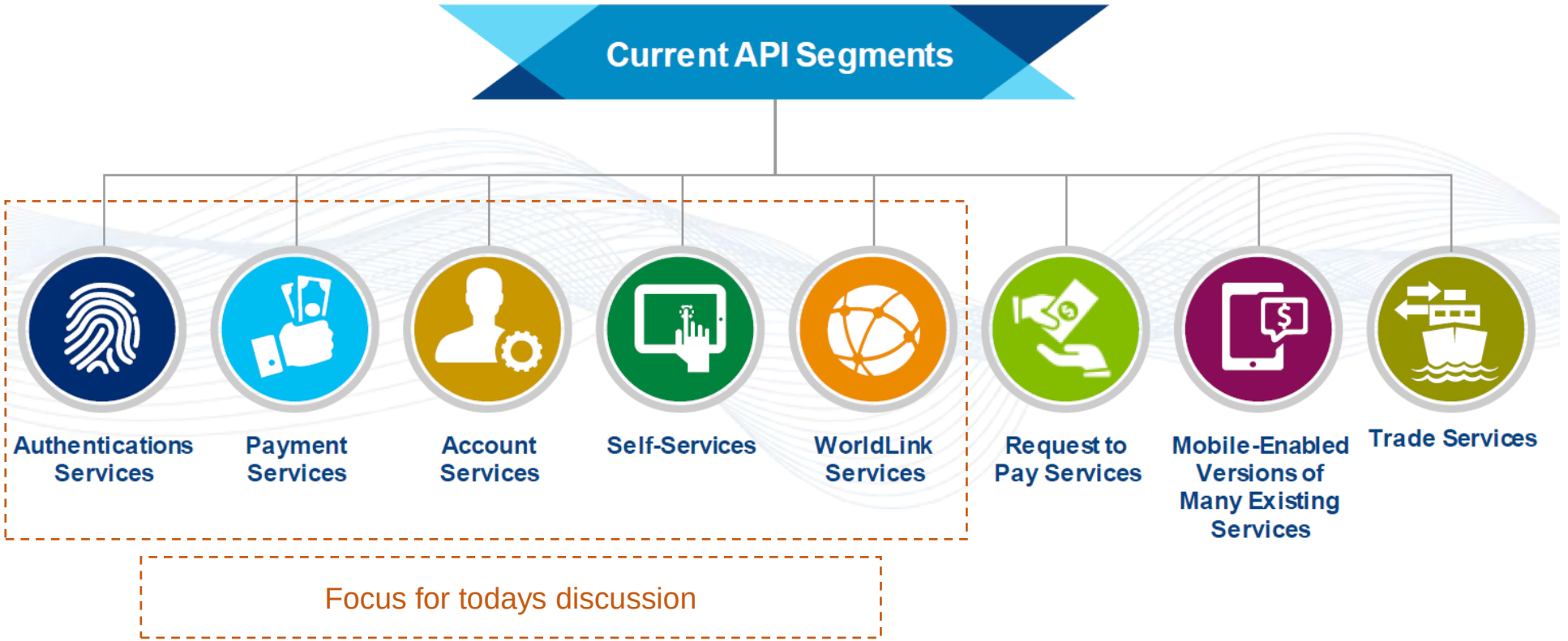
Extended Validation Certificates provides more trust and security than the Domain Validated and Organization Validated Certificates

Certificate Type	X509
Signature Hash Algorithm	SHA256(Minimum)
Key Length	2048-RSA
Certificate File Formats	Base64-encoded X.509 (.cer or .pem)

Innovation: Access to TTS Services Anytime from Anywhere

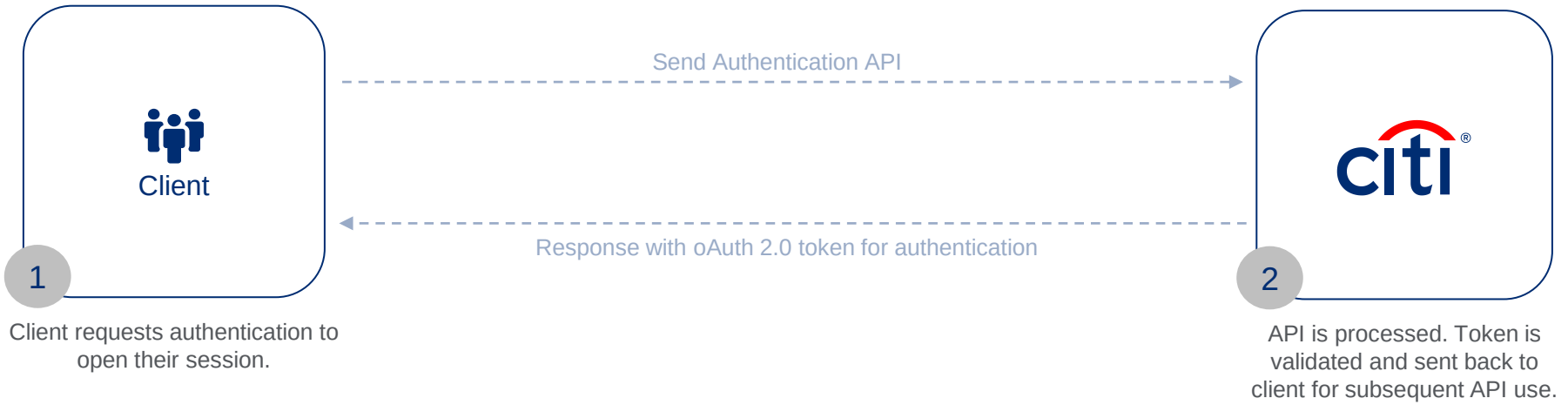
API technology (Application Programming Interface) allows Citi to expose a menu of TTS products and services to our clients anytime, anywhere through customized integration with Treasury Workstations (TWS), Enterprise Resource Planning (ERP) platforms, or other online applications.

Since launching CitiConnect® APIs, we have processed more than 1bn API calls for over 250 clients across a range of functions including: payment initiation, payment status, and/or account balance inquiries. CitiConnect® APIs also encompass real-time information on FX rates, account stater



CitiConnect API | Authentication

Authentication API provides security for all clients and confirms all users' credentials before allowing access to Citi platforms.



Authentication and Security

- Authentication
- Authorization
- Digital Signing and Encryption

What to Know?

- ✓ Utilizes oAuth 2.0 token process
- ✓ oAuth token is valid for *one hour* after retrieval
- ✓ Security Certificates required
- ✓ Authentication API available 24*7
  *APIs available 24*7 still have a possible platform downtime
- ✓ Timeout is contingent on setup
- ✓ Format: XML

Current Available APIs – For FI Clients – Global Clearing

Payment Services

- Payment Status Inquiry
- Payment Status—Push Notifications
- Enhanced Payment Status Inquiry
- Enhanced Payment Status—Push Notifications

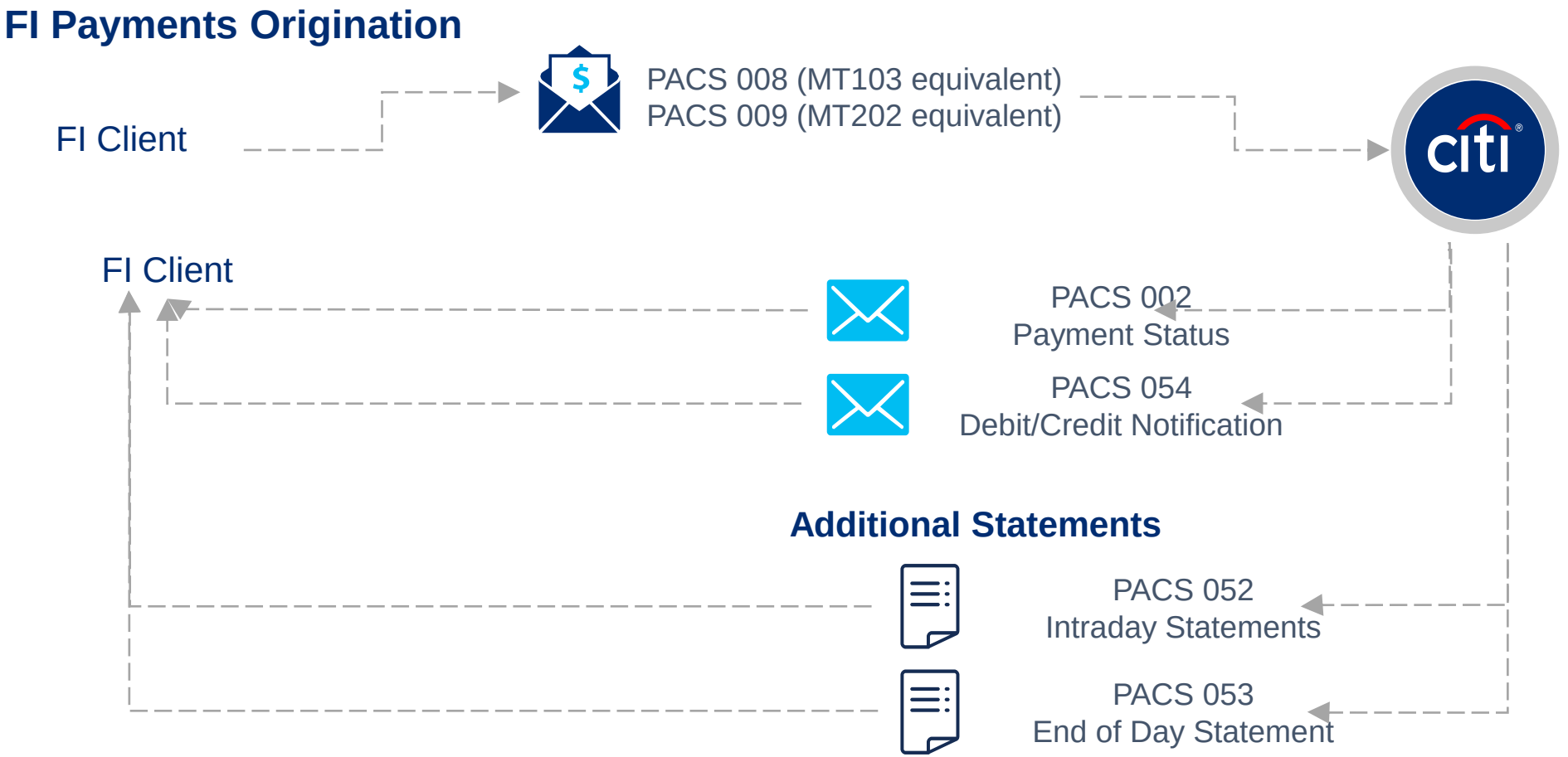
Account Services

- Balance Inquiry
- Statement Initiation
- Credit/Debit—Subscription
- Credit/Debit—Push Notifications

Self-Services

- Payment Cut off Time Inquiry
- Branch Holiday Inquiry
- Proof of Payment
- Transaction Report

Client to Citi API Flow – Clearing USD/GBP/EUR



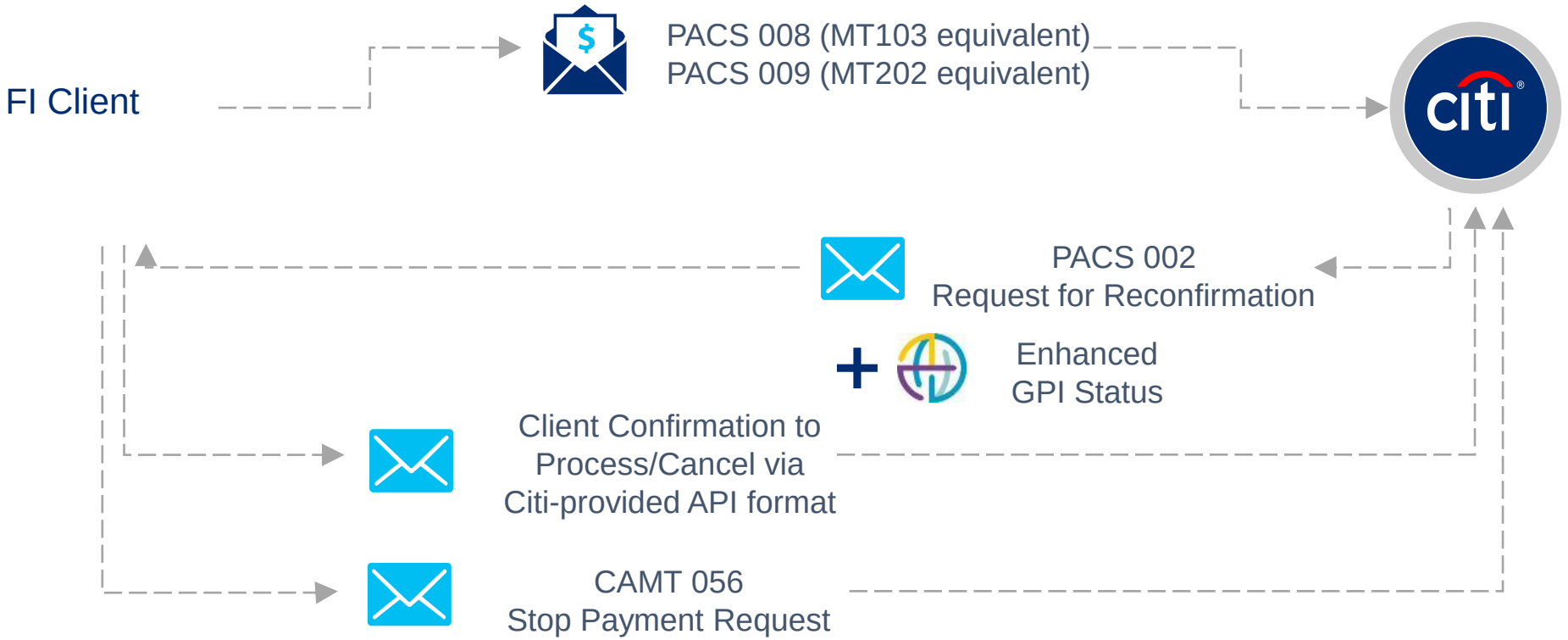
Benefits

- API will allow richer information exchange
- Data availability on Real time basis
- Using Standard Format

Client to Citi API Flow - WIP

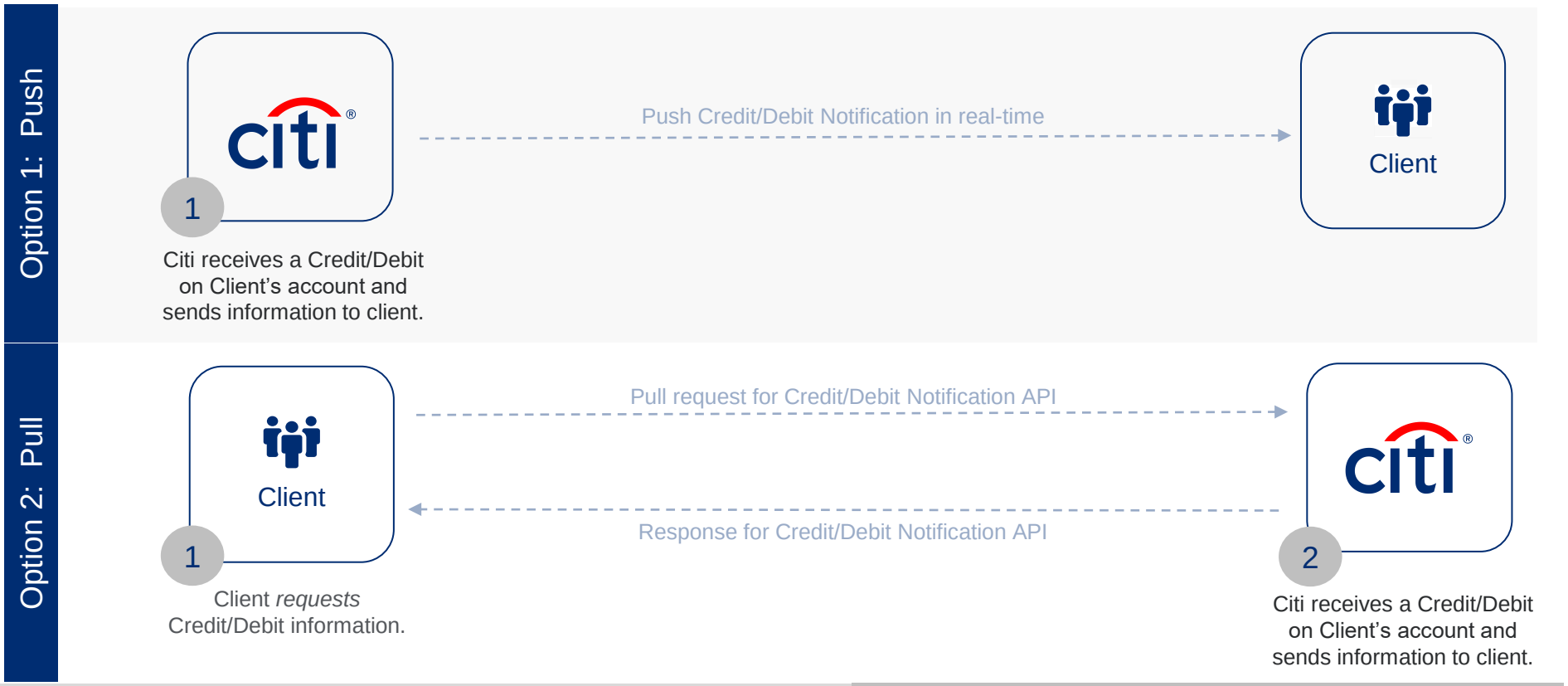
This year we are rolling out richer capabilities: Reconfirmations, Stop payments and End-to-end payment status

FI Payments Origination



CitiConnect API | Credit/Debit Notifications

Credit/Debit Notifications API informs Client of a credit or debit entry in an account.



Credit/Debit Notifications – Use Cases

Clients want real-time insights on credits/debits from their account

User can confirm charges are legitimate

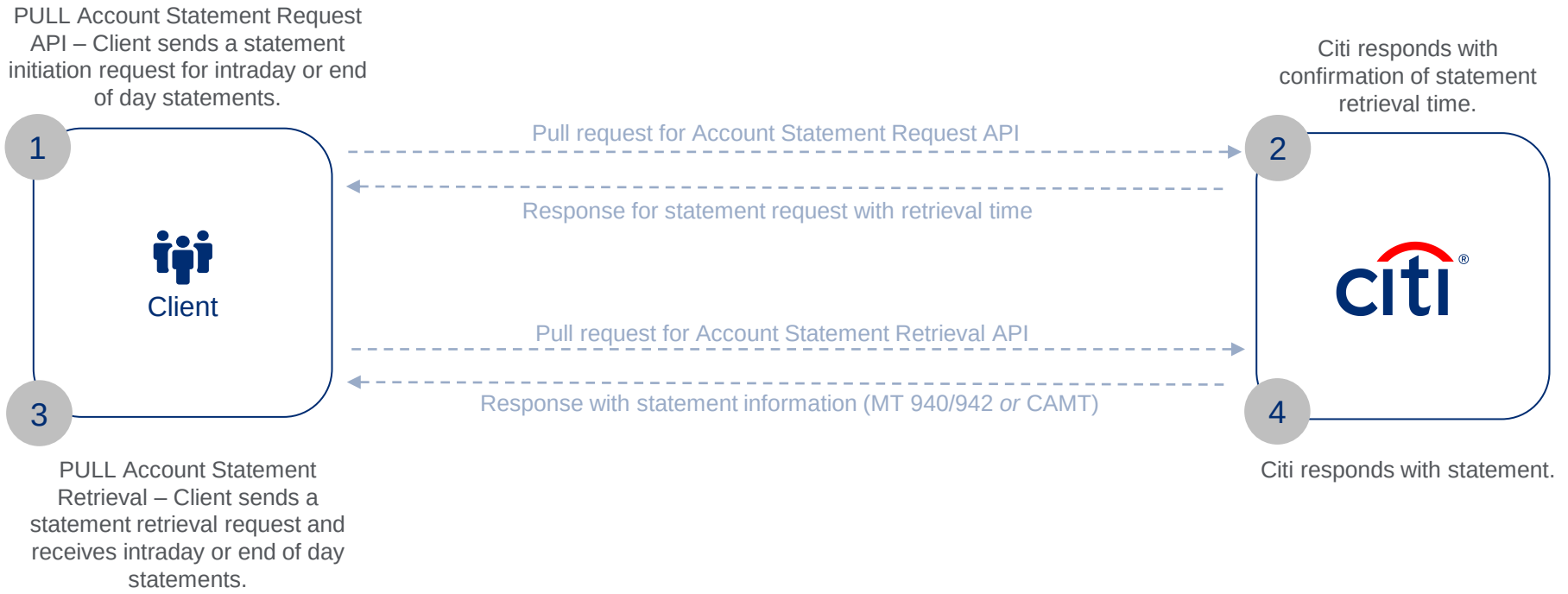
Client won't release goods to Buyer until they are notified of credited account

What to Know?

- ✓ Allows for real-time reconciliation
- ✓ Format: XML

CitiConnect API | Account Statement Inquiry/Request

Account Statement Inquiry and Request APIs obtain the account statement based on a Reference ID provided by Statement Inquiry API for a certain period.



Account Statement Request – Use Cases

Treasury must reconcile account statements with internal records

Clients need account statements to project future P&L

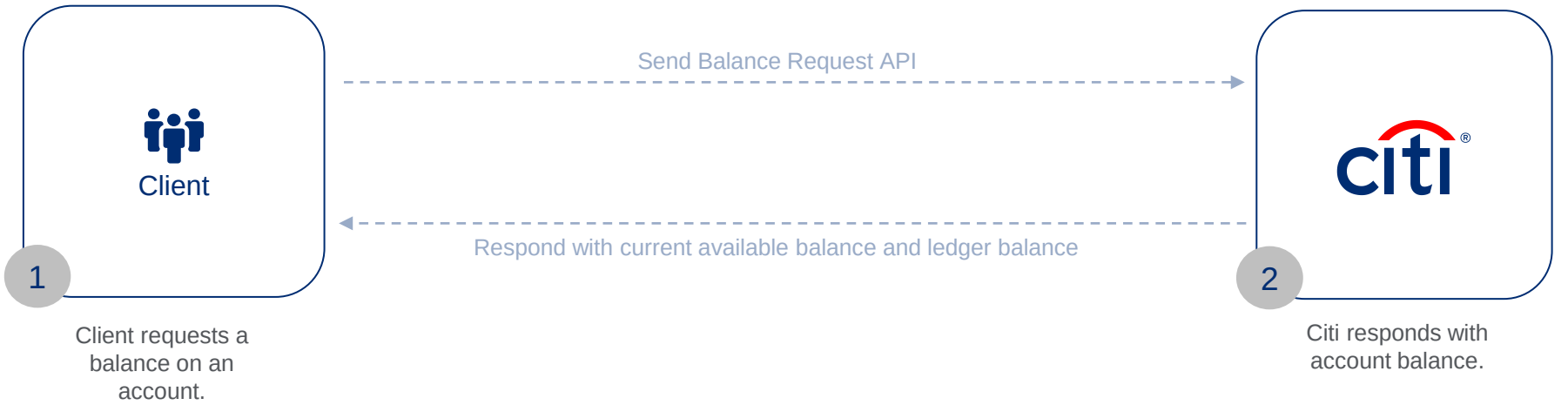
Clients have on-demand access to historical statements

What to Know?

- ✓ Statement Retrieval requests may only be made for one Reference ID
- ✓ Available end of day and intraday
- ✓ Retention is 150 days of data
- ✓ Flexible data extraction – no set schedules
- ✓ Format: XML, SWIFT MT

CitiConnect API | Balance Request

Balance Request API allows Citi's clients to access ledger and available balance across all their accounts with Citi.



Balance Request – Use Cases

- Treasury team needs real-time visibility
- Client must check funds prior to instructing large payment
- Client needs account balances for multiple accounts at once

What to Know?

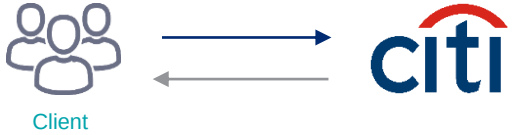
- ✓ Can request balances for multiple accounts in single API call or by branch
- ✓ Must provide an Account Number or Branch ID to solicit a response
- ✓ Format: XML, JSON
- ✓ Response is a customized camt.052 with balances only (ie. no transactions)

Popular Payment Services APIs

Payment Services APIs account for **60%** of our CitiConnect® API client base

Payment Initiation

Seamlessly execute payments



Request: ISO XML Payment Instruction
(ex: PAIN.001)

Response: Payment Acknowledgement

- Client has urgent payment
- Contracted employees want to collect days' earnings

Payment Status Inquiry

Retrieve payment status post payment initiation

Request: Payment ID (End to End ID)

Response: Current Payment Status

- Client wants to know if a payment has been completed
- Client needs to reconcile payment status across systems

Payment Status Notification

Citi will send status changes to you

Push: Transaction Detail

- Client wants to be notified when a payment has been made successfully
- Client needs proof of processed payment with timestamp

WorldLink API Endpoint

WorldLink® is a complete cross-border payment and Foreign-Exchange (FX) service that allows you to perform payments in 135 currencies without having the need to maintain local currency accounts for each of them. CitiConnect® API now offers you WorldLink® services of FX rate enquiry, FX deal booking, cross-border payment initiation with 24X7 availability.

FX Rate Inquiry

Receive the FX rate and Deal ID for a given currency pair

FI Client ⇄ citi

Request: FX Rate Request for Currency Pair

Response: FX Rate and Deal ID

- Client needs to know deal ID for currency of the beneficiary
- Client wants to create multiple international transactions at once

WorldLink Payment Rules

Receive exact requirements for initiating a WorldLink payment

FI Client ⇄ citi

Request: Payment Rules Request

Response: Payment Rules Detail

- Client has urgent payment but doesn't know exact payment rules
- Client needs to understand payment requirements for a certain country

WorldLink Payment Validation

Confirm payment before initiating transaction

FI Client ← citi

Request: JSON, ISO XML Payment Instruction
(ex: PAIN.001)

Response: Payment Acknowledgement

- Payments need validation before being processed
- Clients can use this API for testing in the production environment

Once authenticated, you may perform the following WorldLink® related tasks:

- Inquire about the prevailing FX rates, FX spot tenors or pre-spot where available in the market.
- Validate a Cross border payment against the payment country rules
- Initiate a cross border payment
- Inquire about any previously initiated transaction
- Subscribe for auto-notification on payment status updates.

Appendix / Use Cases

Payment and Inquiry Functions

Account Services offer an array of functionality related to statements and balances.

The functions include:

- Balance Inquiry
- Statement Initiation
- Statement Retrieval
- Credit/Debit—Subscription
- Credit/Debit—Push Notifications

Payment Service functions are among the most commonly used by our clients. They include all payment-related functionality, such as Instant Payments, allowing clients to initiate and reconcile various forms of disbursement.

The functions include:

- Payment Initiation
- Payment Status Inquiry
- Payment Status—Push Notifications
- Enhanced Payment Status Inquiry
- Payment Status—Push Notifications

WordLink and Request to Pay Functions

Here, various WorldLink Services are exposed.

The functions currently include:

- WorldLink FX Rate Inquiry
- WorldLink Payment Initiation
- WorldLink Payment Status Inquiry
- WorldLink Payment Status—Push Notifications

Request to Pay Services offer clients the ability to collect payments from their customers, along with various notification / updating capabilities.

The functions include:

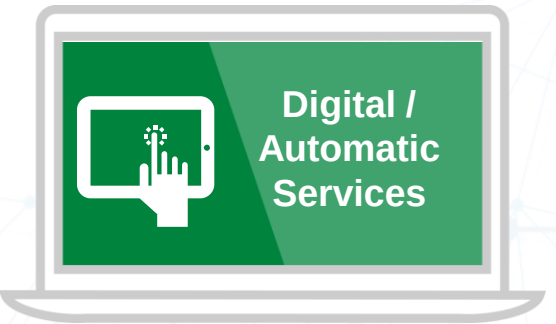
- UPI RTP—Collection Initiation
- UPI RTP—Transaction Inquiry
- UPI RTP—Push Notifications
- RTP—Collection Request
- RTP—Collection Response
- RTP—Collection Inquiry

Digital / Automatic and Mobile-Optimized Functions

Mobile-Enabled Services are a light-weight version of a many of our existing API's, which are optimized to be integrated into a client's mobile app / ecosystem.

The functions include a mixture of the below:

- Authentications Services
- Payment Services
- Account Services
- Self-Services
- Request to Pay Services



Digital / Automatic Services empower clients to determine various rules, system availability, and other search / reporting functionality via API calls.

The functions include:

- Payment Cutoff Time Inquiry
- Branch Holiday Inquiry
- Proof of Payment
- Transaction Report
- Payments Beneficiary Search

Core Access and Security Functions

Authentication Services are leveraged by every client to gain access to our API portfolio. These are a required core set of functions to validate client identity, ensuring they can obtain access to services they are provisioned for.

The functions include:

- Authentication
- Logout

Clients can now initiate a request for the issuance of Trade Guarantees directly from partner applications, such as Enterprise Resources Planning systems and Treasury Workstations. Clients can also request the status of any initiated Trade requests.

The functions include:

- Trade Initiation—enter details of the Guarantee/SBLC
- Trade Inquiry—access the status of your Trade

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