eSign - Evolving Opportunities and Applications

CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING

NOVEMBER 15, 2017

Presentation Outline

e-Sign

Architecture

Interesting Challenges

Roles and Responsibilities

Evolving Applications

Usage Scenario

Digital Signatures

Digital Signatures, IT Act and CCA

Most common and popular method for digital signature is through use of cryptographic USB token

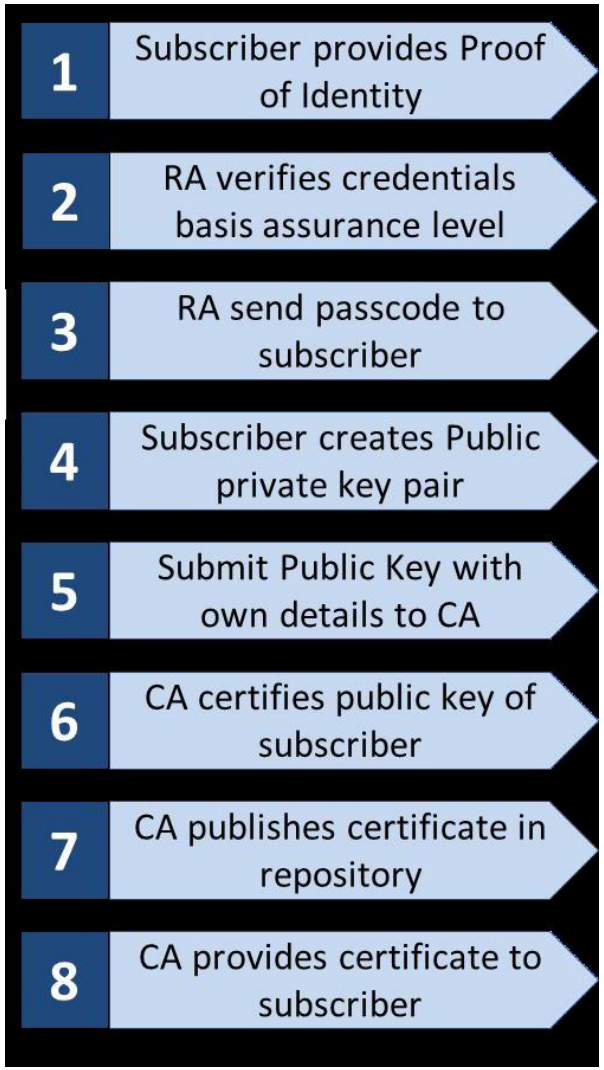
- Private key of the signer is stored in token
- Password while accessing the token provides additional security

Requires application to be submitted to CA

Manual verification of identity – Role of RA

Overall Process

Manual Intervention



eSign

Government of India vide its Gazette Notification (January 2015) announced a method that facilitates CA to offer e-Sign service

Objective of eSign service is to offer on-line service to citizens for instant signing of their documents securely in a legally acceptable form

Two major challenges involved are

- (a) authentication of the user
- (b) Trusted method of signing

Aadhaar eKYC service is used as PoA and PoI

PKI method is used as a trusted method of signing

Citizens with Aadhaar ID can use eSign service to obtain them digitally signed.

eSign Service

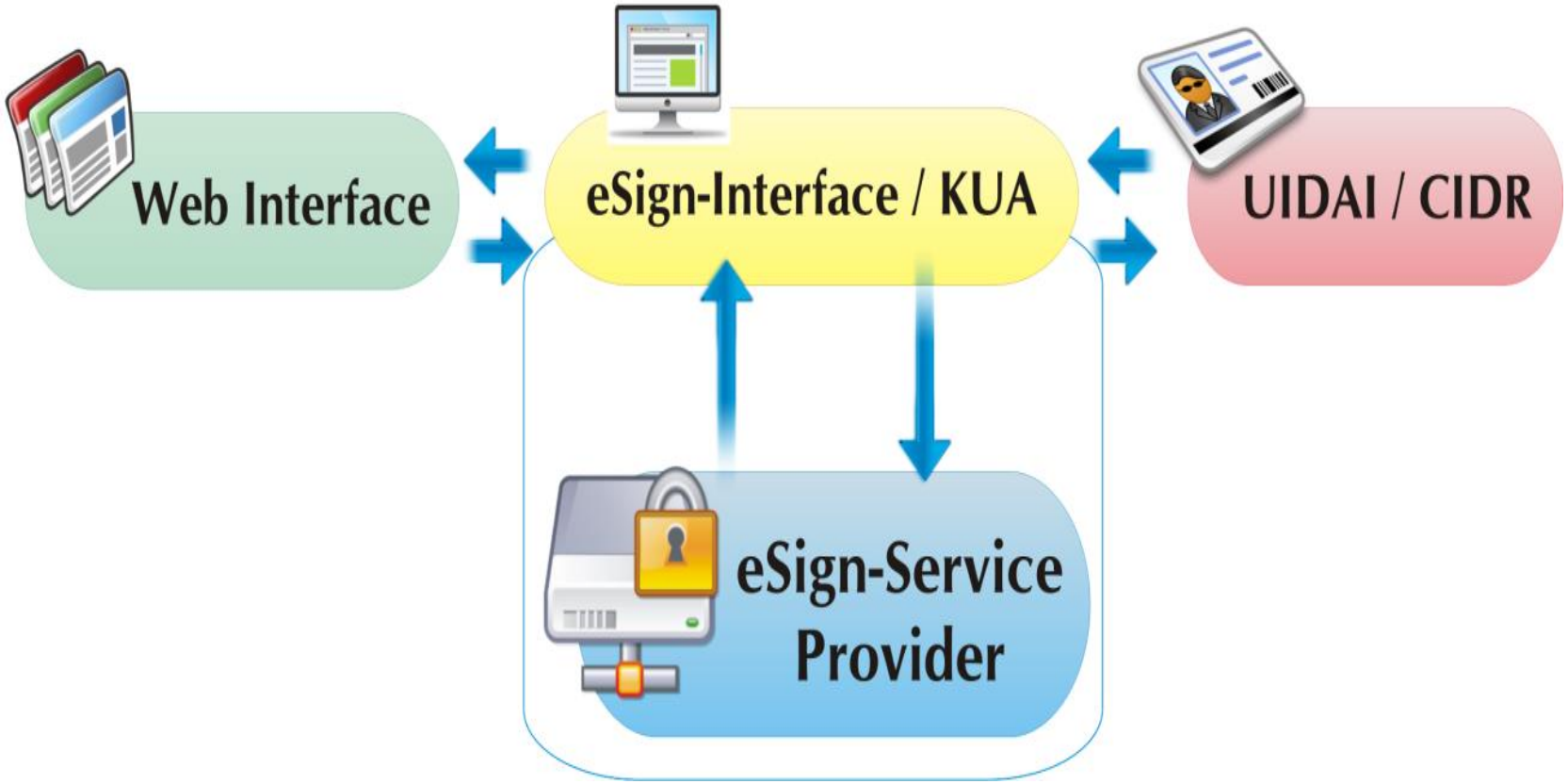
Offers on-line platform to citizens for instant signing of their documents securely in a legally acceptable form

Enables citizens with valid Aadhaar ID and registered mobile number to carryout digital signing of their documents on-line

Certifying Authority (CA) utilizes the service of Unique Identification Authority of India (UIDAI) for on-line e-authentication and Aadhaar eKYC Service

CA under the Controller of Certifying Authorities (CCA)

e-Sign Overview



Highlights

Legally valid (CA under CCA and UIDAI)

- Aadhaar-eKyc – OTP
- Aadhaar-eKyc - Biometric (FP/Iris)

Privacy

- Hash of the document is obtained by ESP for digital signing
- Consent based

Paper-less

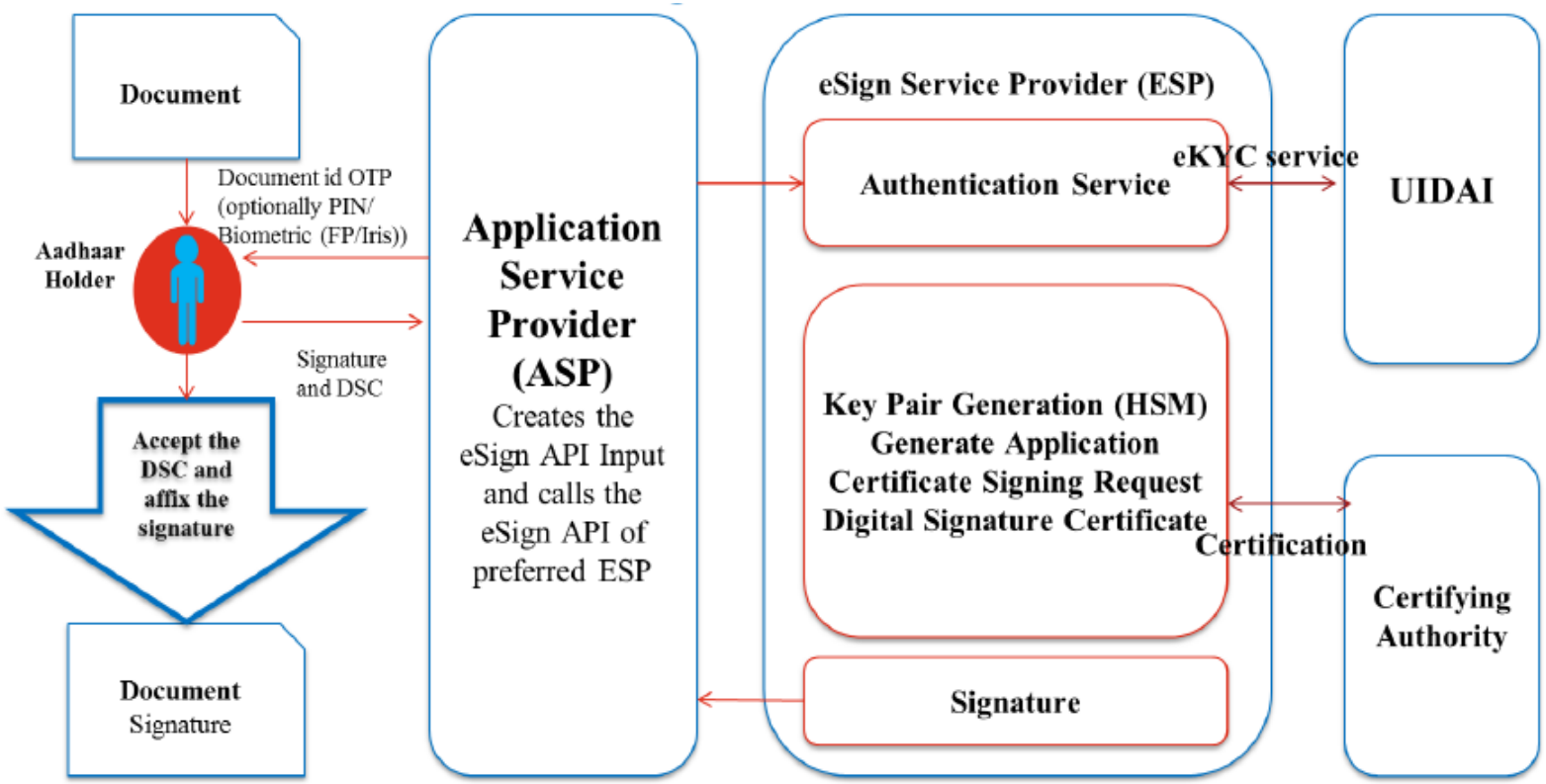
- Aadhaar based fully online electronic service

Ease of use

- No worry of safeguarding keys

Instantaneous and regulatory friendly

Architecture



HSM – Hardware Security Module
OTP – One Time Password
ESP – eSign Service Provider
ASP – Application Service Provider
eKYC – electronic Know Your Customer
DSC – Digital Signature Certificate
FP – Finger Print
UIDAI – Unique Identification Authority of India

e-Sign Framework

Communication between ASP and ESP defined as per CCA guidelines

Communication between ESP and UIDAI defined as per UIDAI guideline

Data exchange using secure channel (HTTPS)

Payload in the format of XML (POST)

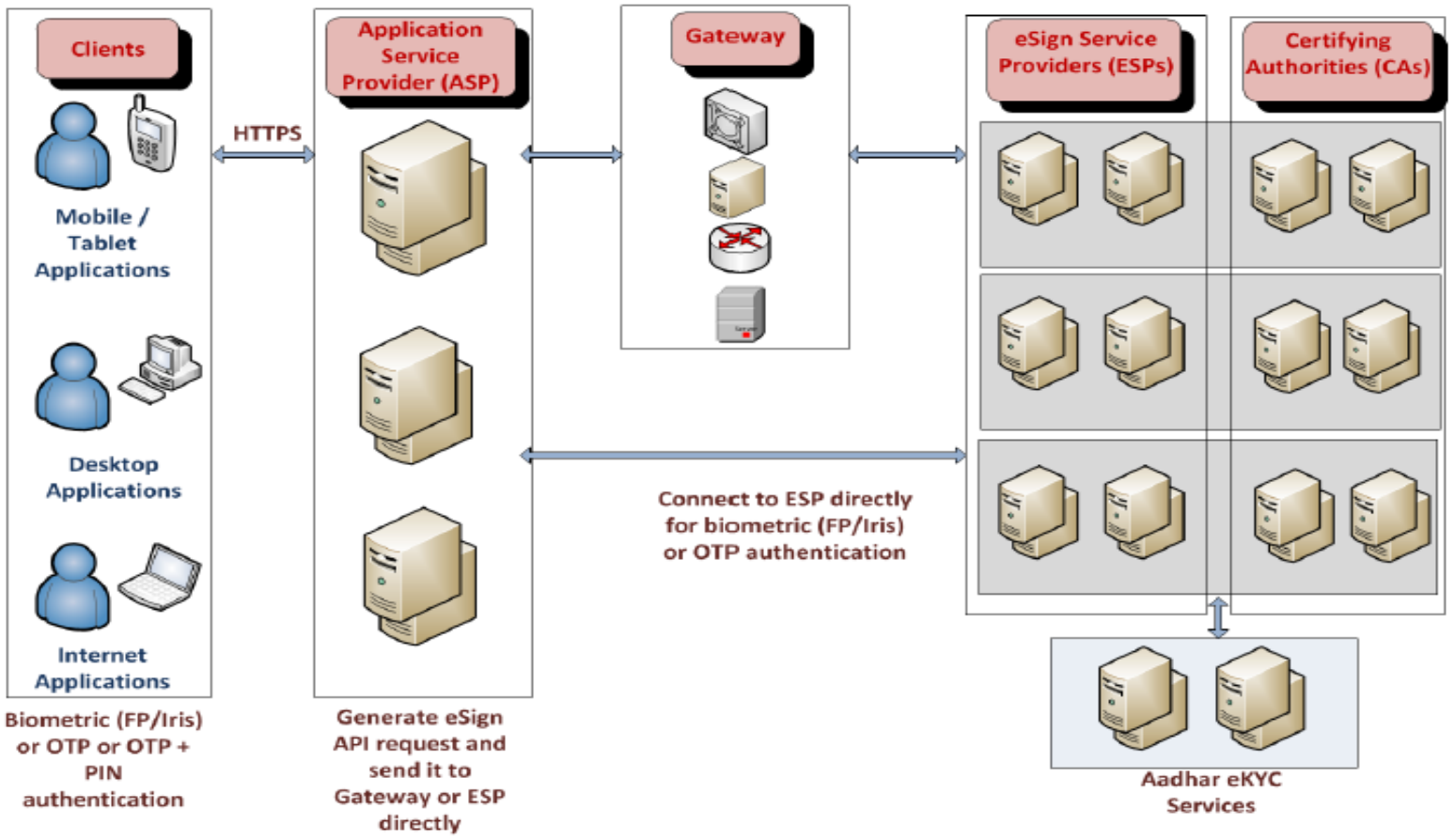
RESTful web service interface

Offers 2 services

- OTP
- Esign

Response in PKCS7 format

Stakeholders in e-Sign Service



Role of ASP

Citizen interacts with ESP through ASP only

Application to enable input of

- Aadhaar number
- OTP value (v1.0 specs)
- Document to be signed
- User consent for using his/her e-KYC data for generating Digital Signature Certificate (DSC)

Receive PKCS7 response

XMLs to be exchanged between ASP and ESP to be digitally signed

Maintain audit logs as per CCA guidelines

Role of ESP

Receive Request XMLs from ASP

Forward requests to CIDR for OTP generation and authentication of user

Generate key pair for the user on HSM

Sign the document hash using private key

Generation of DSC for the user by C-DAC CA

One time usage of key for signing – key pair deleted

Supports document(s) signing

Response to ASP in PKCS7 format (digital signature and certificate chain)

Maintain audit logs as per CCA guidelines

Role of UIDAI

Receive OTP request from ESP

Send OTP to the registered mobile number

Receive user authentication request from ESP

User’s e-KYC given as response to ESP on successful authentication

eSign v2.0 Specs

Data exchange using secure channel (HTTPS)

Payload in the format of XML (POST)

RESTful web service interface

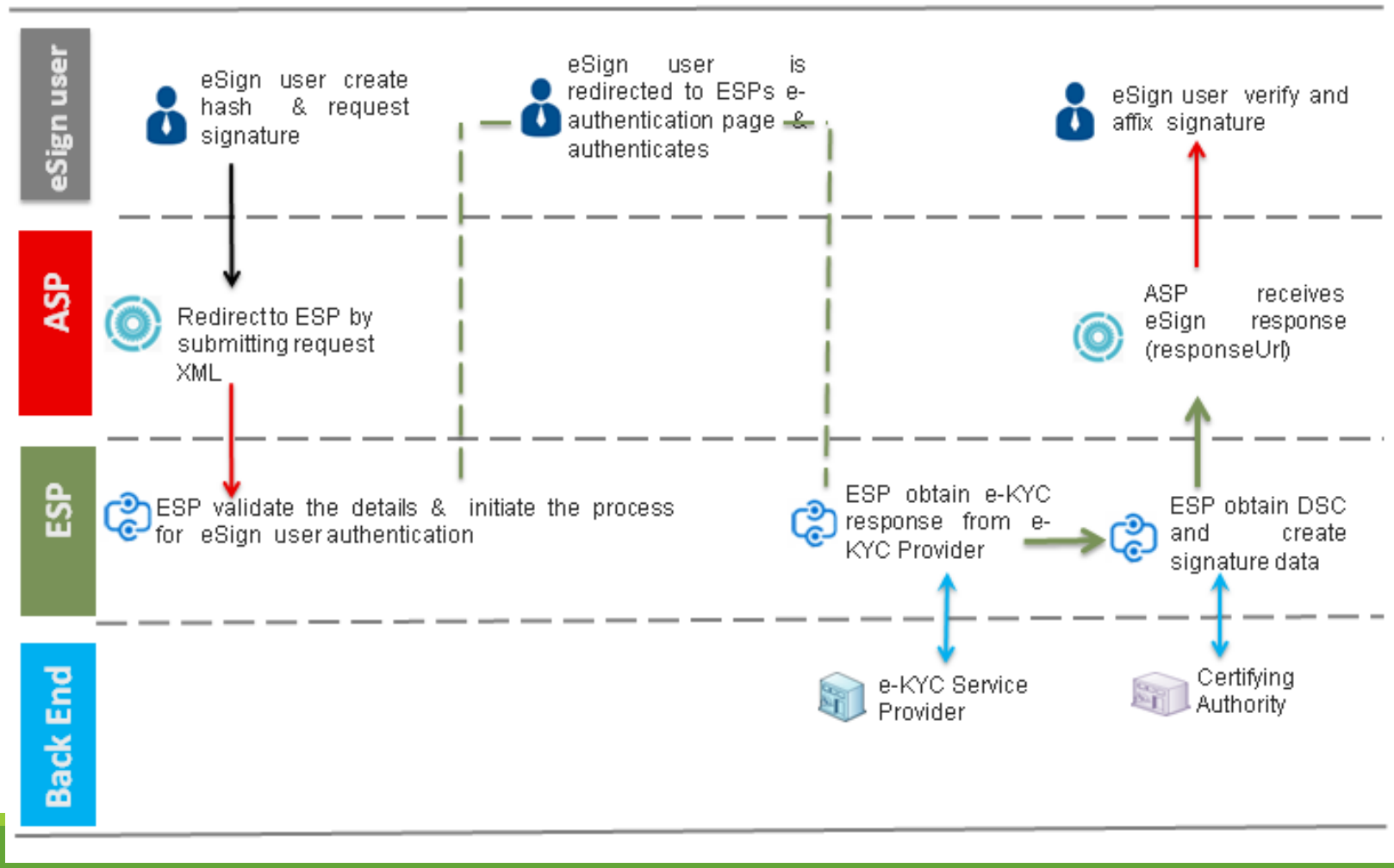
Offers eSign under 2 scenarios -

- User performs eKYC via ASP application and sends authenticated response for signing
  - PreVerified eKYC: enables ASP to leverage its KUA service for authentication purpose
- ESP facilitates authentication of eSign user and uses the response for signing

Bulk signing facility – upto 10 document hashes can be signed in a single request

Response in PKCS7 format

eSign v2.0 Overall Flow



Evolving Opportunities & Applications

Evolving Opportunities

	Various Sectors	
1.	Digital Locker	Self-Attestation
2.	Financial Sector	Application for account opening in banks and post offices (Loan processing,
3.	E-Governance	Documents to be furnished by Citizen or being offered to citizen (birth certificates, caste, marriage etc.)
4.	Universities	Certificates and application forms for course enrollment and exams
5.	Health	Prescription, integration with HMIS, Telemedicine
6.	Transport Department	Application for driving license renewal, vehicle registration
7.	Telecom	Application of new connection
8.	Legal	Documentation

Common Use Cases

Inter departmental Workflow automation (HR, procurement, claims etc in Govt.)

Business to Customer Services

- eSign enabled Online application

Business to Business

- eSign enabled online Process Flow
- eSign enabled online Legal Contracts

ESPs and Usage scenario

ESIGN SERVICE PROVIDERS

1. eMudra Ltd
2. Centre for Development of Advanced Computing (C-DAC)
3. (n)-Code Solutions
4. NSDL eGovernance Infrastructure Ltd
5. Capricorn Identity Services Pvt Ltd.

Costing models

Per signature costs

Costs towards ASP development and integration

Bulk-signing cost

User based pricing (packs)

References

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Thank You