

RS RTP - Connect™ UPI Integration Manager

Background

After launching the Unified Payments Interface (UPI) in April 2016, the National Payments Corporation of India (NPCI) went a step further and announced the UPI based BHIM (Bharat Interface for Money) app to acquire UPI based transactions and route them to all participating banks in India. While the banks have since built their own UPI enabled payments app, they are obligated to accept transactions from non-banking payment apps like BHIM. With the recent changes in the Indian payments landscape triggered by demonetization and the push for digital transactions, the volume of UPI transactions increased ten times over a period of just three months and promises to grow further. Unfortunately, existing UPI infrastructures for most banks are not adequate to cater to this exponential growth.

RS RTP - Connect™ - The UPI Platform from RS Software

RS RTP - Connect™ is a proprietary platform from RS Software that enables Banks and Payment Service Providers (PSP) to integrate with the UPI Central Platform. RS RTP - Connect™ communicates seamlessly with NPCI's UPI and integrates with Core Banking Systems (CBS). It provides a number of payment APIs that can be consumed by digital banking platforms, enabling mobile and internet based applications for the end consumer.

RS RTP - Connect™ is an API based UPI payment processing platform with high availability, reliability and security. The platform has been built using modern architecting principles and provides an active-passive, configurable architecture across two or more data centres.

Salient Features - Business

- Bank onboarding and access management
- Transaction orchestration with UPI host via bank connectivity
- Payment transactions (Push & Pull) APIs and meta-APIs

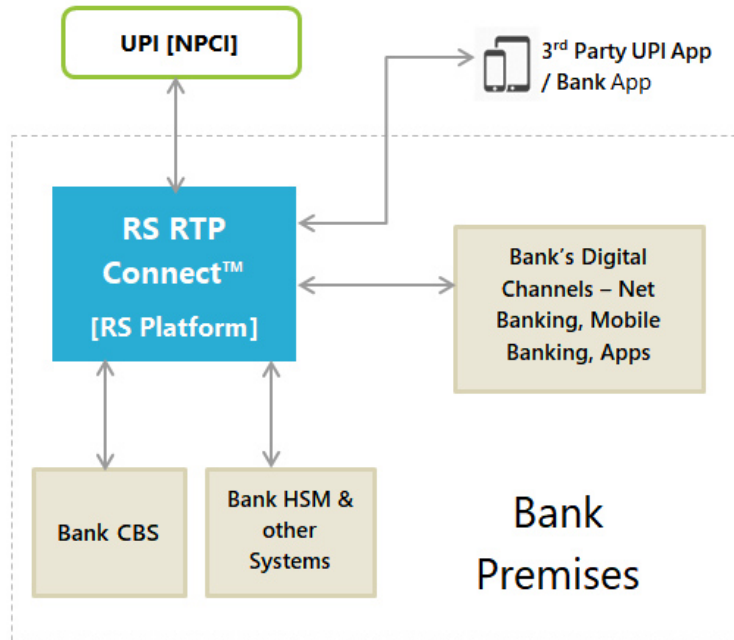
- Virtual address management (PSP virtual address, Merchant specific virtual address etc.)
- Global address management like Aadhaar, mobile number etc.
- Single-click 2-factor authentication with authentication factors like OTP, mPIN etc.
- Encryption management with Hardware Security Modules for PIN authentication and Digital Certificate management
- Integration with Bank CBS and Hardware Security Module (HSM). Supports all major CBS such as Finacle, Bancs, Flexcube etc.
- Reconciliation and Settlement as defined by NPCI
- SMS and E-Mail integration with the bank's existing system or a hosted service
- Admin portal for:
 - * Configuration management
 - * Access management
 - * Reporting and analytics
 - * Transaction history
 - * Responsive dashboards where the visualization can be configured to various formats of tables, graphs, dials, etc.

Salient Features - Technical

- High volume business transactions on a scalable (horizontal and vertical) and reliable (fault tolerance, BC, DR) architecture brought in by distributed processing with built-in support for near-zero RPO and RTO
- High throughput enabled using cached parameters that can be referred by in-flight processing components
- 99.999% availability with adequate fall-back and redundancy
- Highest level of security for communication with Bank CBS and other subsystems using industry standard security protocols with up to 2048-bit encryption and SHA1/SHA2/RSA algorithms
- Workflow to support business processes which can span from short to long completion cycles
- Secured file-based data transfer service for offline information exchange
- Managed logging of high volume OLTP logs
- Scheduler triggered execution for processing, report generation, and loading of data from secure data area
- 24x7 Application and System monitoring with built-in alert notifications and early warning systems
- Batch processing and secured batch transportation through SFTP
- Data archival for at least six months

Platform Overview

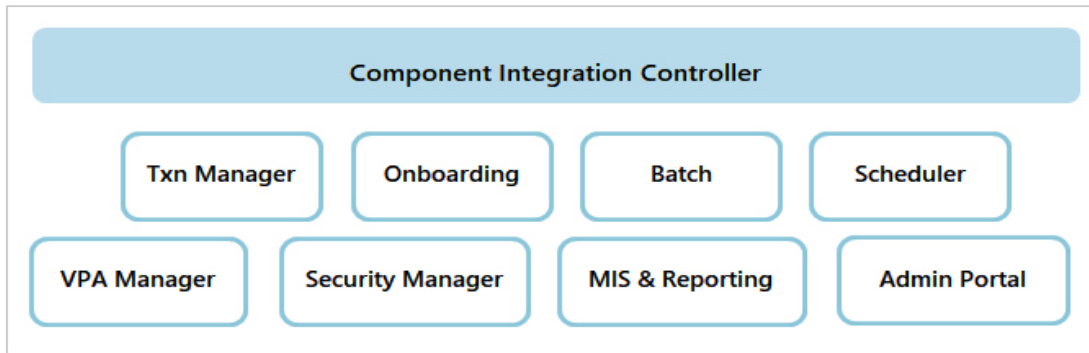
A high-level view of RS RTP - Connect™ with respect to bank and NPCI would be as follows: RS RTP - Connect™ will be placed in the Bank premises, and will perform the following key functions:



1. **CBS Integration:** RS RTP - Connect™ communicates with Bank CBS for debit/credit processing.
2. **HSM Integration:** RS RTP - Connect™ communicates with Bank HSM for PIN processing.
3. **Digital Channels:** The platform integrates with digital channels like Net Banking, Mobile Banking and existing Bank Apps.
4. **3rd Party App:** RS RTP - Connect™ provides APIs for 3rd party PSPs to integrate with the Bank's CBS and get access to the UPI platform.
5. **Other Subsystem Integration:** RS RTP - Connect™ also enables communication with other bank systems like email or SMS servers.

RS RTP - Connect™ Functional Architecture

A functional overview of RS RTP - Connect™ is illustrated below:



Summary of components

- **UPI Mobile Component:** Mobile component to be delivered as a component in the mobile banking app of the bank.
- **UPI Net Banking Component:** A component/SDK which may be called from the Net Banking portal of the bank to make the payment through UPI.
- **Web Service Layer:** A set of web services to be published for Mobile and Net Banking components.
- **CBS Adapter:** An adapter layer for communicating with the CBS of the bank, either directly or through an enterprise service bus or message broker.
- **UPI Adapter:** An adapter layer for communicating with UPI through the NPCI-provided router. This may generate the URL to post the message to UPI.
- **Component Integration Layer:** A layer for communicating among the components within UPI Payments. The communication may be synchronous (via spring integration) or asynchronous (via spring integration and reactor bus).
- **Request Processor:** A core request processor for handling every request from the user and UPI. It communicates with other components like PA Manager, and User Profile Manager to accomplish the requested task.
- **PA Manager:** Payment Address Manager manages payment addresses for all users and provides different kind of services like payment address resolution, validation, availability check etc.
- **User Profile Manager:** Manages user profile and accounts.
- **Event Scheduler:** Manages and schedules different kind of events in UPI Payments business flow.
- **Batch Processor:** Manages and runs different kind of batch processing in UPI Payments.

- **Settlement:** This module handles the settlement processing of the transactions.
- **Security Manager:** Manages authorization scope of different kind of users for the services.
- **Notification Manager:** Handles different kind of notifications to users through various channels like email, push notifications, SMS etc.
- **Reports:** Standard and customized reports as requested by Banks.

About RS Software

RS Software is a focused player in the Electronic Payments domain with more than 25 years of experience in providing customized software solutions to the payments industry. RS Software is the technology partner of choice for NPCI to build UPI, their digital payment platform that aims to be an overlaying platform that unifies different NPCI payment platforms like IMPS, NFS, AEPS, and RuPay, while simplifying digital payment processing for banks.

RS Software proudly serves a number of the world's leading payment brands, providing solutions across all areas from switching and authorization, clearing and settlement, risk and fraud management, dispute management and data management.