Connection Direction
Connecting to the RTP® Network
Themes and topics to today’s discussion

- What is Real-Time Payments?
- What is the clearing and settlement network landscape?
- What kinds of vendor offerings exist?
- Which vendor aligns to which network?
What are Real-Time Payments?

Party A → Bank A → [Check] → Bank B → Party B

- Party A: Initiate payment to Party B
- Bank A: Initiate good funds guarantee transaction
- Core Infrastructure: R | T | P
- Bank B: Send message of incoming payment transaction
- Party B: Funds immediately available for spend or withdrawal
Features

Speed features

- Confirmation to both sender and receiver
- Posting of good funds <15 seconds
- Irrevocable (no charge backs)
- Bank-to-bank ubiquitous 24/7/365
- Real-time settlement

Rich remit data

- Real-time notifications
- Bi-directional extended messaging and remittance attachments
- Straight-through processing
- Request for payment

Highly secure

- Authentication support
  - MFA
  - Biometrics
- End user privacy and security
  - Biller directory
  - Tokenization
  - End-to-end encryption
- Fraud prevention

Channel and form

- Designed for APIs
- Multi-channel access – including online and mobile
- Improved user experience

Interoperable

- Potential for cross-network interoperability (ISO2022)
- Potential for cross-border interoperability (ISO2022)
Drivers

**Small Business**
As real-time payments gain market traction, Key’s clients will expect access to the network.

**Banks**
Helps banks provide convenient online and mobile banking experience and create new retail and corporate offerings.

**FinTech**
Can receive information regarding payments directly.

**Large Business**
Makes cash management with timely incoming and outgoing payments and treasury services more efficient.

**Government**
Allows government agencies to make emergency payments (FEMA), distribute welfare payments and collect taxes faster.

**Consumers**
Allows consumers to pay their bills faster at the last possible moment.
Points to consider when implementing a Real-Time Payment platform

What is driving the faster payments environment?

Key senior leadership commissioned the Enterprise Commercial Payments business team to develop a strategy around real-time payments. Since that time the business, in partnership with technology, have worked to define product use cases and map them to technology and process implications.

- **Technology innovations** speed of e-commerce, big data, APIs, real-time settlement is driving domestic P2P providers are encroaching into bank territory.
- **Worldwide trends** as the roster of countries adopting real-time payments grows, the pressure is on the U.S.A. to lay the groundwork and support instant/faster payments is likely to increase.
- **Customer expectations and demographics** Due to swiftly changing customer demographics, many consumers and businesses expect almost everything to be available in real-time.
- **Merchants expectations** many small businesses and large retailers are looking at real-time payments to enhance their cash flow management, reduce fraud activity and provide incremental value to their customers.
- **FinTech** in the last five years numerous FinTech startups have launched with a focus on mobile/e-wallets while focusing on real-time services.
- **Industry momentum** In the U.S. the Clearing House, NACHA and the Fed each contributed to the arrival of faster payments.
## Clearing and settlement network landscape

<table>
<thead>
<tr>
<th>Zelle</th>
<th>The Clearing House RTP</th>
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</thead>
<tbody>
<tr>
<td>• Created to be the chartered financial institution answer to FinTech P2P payment networks</td>
<td>• New payment rail built to conform to the Fed Faster Payments Effectiveness Criteria</td>
</tr>
<tr>
<td>• Owned by the top six US banks</td>
<td>• Suitable for all payer/receiver use cases (P2X, B2X, G2X)</td>
</tr>
<tr>
<td>• Accessible by over 100 banks by EOY 2018</td>
<td>• Designed to send value-add messages along with payments</td>
</tr>
<tr>
<td>• Provides clearing messages, today settlement handled via ACH but it will be settled over RTP in the future</td>
<td>• Provides both clearing and settlement</td>
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</table>

Q2 2017

Q3 2017
<table>
<thead>
<tr>
<th><strong>Vendor offerings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform providers</strong></td>
</tr>
<tr>
<td>• Provide connectivity to clearing/settlement networks</td>
</tr>
<tr>
<td>• Enable flexible client facing products to be built</td>
</tr>
<tr>
<td>• Similar to existing payment gateways (e.g. ACH, Wire)</td>
</tr>
<tr>
<td>• Examples: IBM FTM, Dovetail Universal Payments, FIS Open Banking Framework, ACI – UP Immediate Payments, VolPay</td>
</tr>
<tr>
<td><strong>Service providers</strong></td>
</tr>
<tr>
<td>• Client-facing product is ready-made by the provider</td>
</tr>
<tr>
<td>• Key doesn’t directly connect to the clearing / settlement network</td>
</tr>
<tr>
<td>• Examples: Fiserv, CheckFree, PopMoney, FIS Bill Pay, PeoplePay</td>
</tr>
</tbody>
</table>
Vendor / network alignment

**Faster payments**
- Pay with Bank app
- Paytm
- Zelle
- Direct Deposit

**ACH**
- Zelle
- Venmo
- Dwolla
- Popmoney
- Direct Debit

**Cards**
- Venmo
- PayPay
- Mastercard
- VISA Direct
- Same-day ACH

**Closed loop**
- Venmo
- Paymentus
- Leverage card & ACH rails for bank transactions (RTP)

**Distributed ledger**
- Abra
- Airbitz
- Bitnet
- Xapo
- Gem
- Ripple

**Applications & services**
- Infrastructure layer (the rails)
- Bank controlled
- Bank accounts
# Reflections on U.S. adoption

<table>
<thead>
<tr>
<th>Innovator banks</th>
<th>Early adopter banks</th>
<th>Laggard banks</th>
<th>FinTechs</th>
<th>Central bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro-active RTP adoption to demonstrate market leadership, has ability to influence the evolving RTP standards and protect large customer base</td>
<td>RTP acceptance to retain &amp; grow market share, analyze whether direct or indirect participation makes business case for your client base</td>
<td>Evaluate whether pursuing RTP and / or Zelle, but they want to offer through indirect participation</td>
<td>Most are providing comprehensive solutions, and through their “core” partnership they have with banks offer secondary services like the ‘Push’ and “Pull” services and other faster payment solutions</td>
<td>Federal Reserve Bank – whether they will mandate or launch their own version of Real-Time Payment rail, will have to provide structure around this new rail, publish regulatory guidelines and make it affordable to every size financial institution</td>
</tr>
</tbody>
</table>
KeyBank and Real-Time Payments

RECEIVE 2018

Consumer
• Urgent / emergency
• Refunds
• Entitlement programs
• Loan disbursement
• Corporate disbursement
• Legal
• Account-to-account transfers

Commercial
• Urgent / emergency
• Refund payments
• Subsidy
• Commerce
• Supplier / vendor payments
• In-house partner / subsidy payments
• Legal settlements
• Corporate disbursements
• Trade processing

Public Sector
• Urgent / emergency
• Inter-government transfers
• Standard government receiveables

Send capabilities available in 2019
How can a TPSP help?
How a TPSP helps to deliver real-time payments

FIS is well positioned to offer Real-Time Payments in a hosted model as a unique way to enable financial institutions to deploy a growing product base.

- **Speed to Market**
  - Accelerated deployment
  - Enable business case

- **Ease of Deployment**
  - Low initial capital investment
  - Defined interfaces
  - FIS manages connectivity and maintenance

- **Opportunity for Growth**
  - Revenue realization
  - Payments modernization

- **Seamless Integration**
  - SLA management
  - Standard integration protocols
What are the points of integration?

- Payment Management System
- Channels
- Downstream systems
- Core Banking
- Overlays
- Network
- Portals for payment origination
- Posting systems, GL's, loans
- Gateway to TCH
- Back office processing system to manage transactions
- Reporting, alerts, archives
- Fraud, liquidity, stops
Areas of Focus

Operations
Technology
Product
Risk and Compliance
Areas of Focus

- Manage inquiries
- Ability to monitor and react 24x7x365
- Outline error resolution follow up needs
- Update settlement balancing procedures
- Update procedures for additional remittance source
Areas of Focus

Incorporate faster into overall product offerings

Map desired user experience to meet your brand

Productize “faster” as receiving and initiator
Areas of Focus

Operations

Technology

Product

Risk and Compliance

Design elegant interface to present and respond to faster payments

Manage to SLA needs

Practice redundancy and update processes
Areas of Focus

Operations
Technology
Product
Risk and Compliance

Determine changes to terms and conditions
Review responsibilities
Update underwriting procedures
Review posting needs to required and additional information
### Additional support considerations

<table>
<thead>
<tr>
<th>Category</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| Monitoring     | • Exception handling  
                | • Fraud  
                | • Reporting and data extracts                      |
| Servicing      | • Client inquiries  
                | • Investigations  
                | • User Interface  
                | • Hosted Client Support                             |
| Maintenance    | • Stand-in  
                | • Regular updates  
                | • Regulatory changes                                |
| Reconciliation | • Fed account  
                | • General ledger  
                | • Enterprise Liquidity                              |
## Deployment Options

<table>
<thead>
<tr>
<th></th>
<th>On Premise</th>
<th>Service Bureau Multi-tenant</th>
<th>Hosted Single-tenant</th>
</tr>
</thead>
<tbody>
<tr>
<td>License ownership</td>
<td>Bank</td>
<td>Vendor</td>
<td>Bank</td>
</tr>
<tr>
<td>Shared platform</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Release Management</td>
<td>Bank</td>
<td>Vendor</td>
<td>Shared</td>
</tr>
<tr>
<td>Technical Support</td>
<td>Bank</td>
<td>Vendor</td>
<td>Shared</td>
</tr>
<tr>
<td>Core Integration</td>
<td>Bank</td>
<td>Vendor (Vendor Assets)</td>
<td>Bank</td>
</tr>
<tr>
<td>Customizations</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>TCH Engagement</td>
<td>Bank</td>
<td>Vendor</td>
<td>Bank</td>
</tr>
<tr>
<td>TCH Connectivity</td>
<td>Bank</td>
<td>Vendor</td>
<td>Vendor</td>
</tr>
<tr>
<td>Pricing model</td>
<td>License (implementation optional)</td>
<td>Hosting fees + implementation</td>
<td>License + hosting + implementation</td>
</tr>
</tbody>
</table>
Deployment Considerations

4-phased joint onboarding approach to enable US RTP processing

Plan
- Establish project teams, management routines, and stakeholder meetings
- Requirements gathering
- Define client readiness activities
- Define scope and project plan
- TCH Engagement

Design
- Workshops covering RTP & interfacing
- Internal designs for RTP interfacing

Build
- Completion of required technical development and integrated testing
- USRTP user interface overview and training
- Vendor completes UAT environment preparation

Run
- Integration Testing
- Client UAT
- Go-Live
- Transition client to Vendor Operations
Connecting Directly to the Network

Powering Smarter Payments
RTP Onboarding Timelines

The following phased approach aims to forecast the length of time it will take TCH to successfully onboard a Client onto Real Time Payments (RTP):

<table>
<thead>
<tr>
<th>Phase</th>
<th>Length</th>
<th>Key Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement</td>
<td>Can vary</td>
<td>• Both phases are dependent on the level of client engagement. Before TCH can move forward to the implementation phase, we require a signed participation agreement and that the Client meets the qualification criteria.</td>
</tr>
<tr>
<td>Planning</td>
<td>• 17 Weeks</td>
<td>• Client is leveraging existing circuits for both their primary and alternate sites or using a VPN connection.</td>
</tr>
<tr>
<td></td>
<td>• 28 Weeks</td>
<td>• Client requires brand new circuits for both their primary and alternate sites.</td>
</tr>
<tr>
<td></td>
<td>• Other</td>
<td>• If the Client requires new circuits, TCH is assuming that a Client will be ready to place an order for them at the time of the implementation kickoff meeting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Client should be ready to submit all onboarding forms within 2 weeks of the implementation kickoff meeting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Once connectivity is established, functional testing should be finalized and client application is fully ready to be tested.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Overall phase is dependent on level of Client Engagement</td>
</tr>
<tr>
<td>Monitoring</td>
<td>• 2 Weeks</td>
<td>• Contingent on Client successfully implementing RTP.</td>
</tr>
</tbody>
</table>
## Critical Participant Decisions

<table>
<thead>
<tr>
<th>Category</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configurations with testing/implementation scope implications</strong></td>
<td>➢ What message types will be actively used by participant applications upon implementation? (assumes the Participant knows which applications will be included in scope of the initial implementation)</td>
</tr>
</tbody>
</table>
|                                                                         | ➢ Will a new connection to TCH be established for RTP or will an existing connection be reused?  
• What type of connection will be used in production?                      |
|                                                                         | ➢ Which RTN numbers will be included in scope of the initial implementation? Will each RTN number be implemented for the same send and receive services?                                                         |
|                                                                         | ➢ How will the participant perform reconciliation of all RTP activity? (How will participant retrieve detailed reconciliation reports?)                                                                       |
|                                                                         | ➢ Are there any lockdown or freeze periods which will affect the testing or the go-live date?                                                                                                               |
|                                                                         | ➢ Are there restrictions that the Participant has in their data centers which would factor into their ability to connect to RTP?                                                                             |
| **Participant Configurations to be determined prior to go-live**         | ➢ Who will need access to the Management Portal, and what access privileges will they require: User account setup? Reporting? Treasury Management?                                                              |
|                                                                         | ➢ Will significant changes be required to the Participant’s Customer Facing UI?  
• How will a Customer be notified of a successful payment message?  
• What Participant Application will connect to RTP?                        |
| **Participant Resource Considerations**                                 | ➢ Can the Participant provide key project resources that will remain engaged in the overall onboarding process?                                                                                           |
Production Connectivity options

Connectivity to the RTP system by two means, MPLS and Site-to-Site VPN. Either method provides the same access to the application. Production connection method may differ from Bank Test connection.

**MPLS – dedicated connection**
- Share circuits currently set up for TCH Products: EPN or CHIPS
  - Consider if there is sufficient bandwidth
- New DS3 circuits
  - 2 routers, 2 circuit providers = 4 fractional (10mbps min) DS3s.
  - Participant FI may run Active/Standby or Active/Active
  - TCH runs Active/Active

**Secure VPN:**
- 4 routers, 2 secure tunnels configured for connection to Active/Active TCH sites
Onboarding Duration: Roughly a 6-month process

- Implementation displayed:
  - Pre-existing VPN test connection
  - New MPLS production circuits

* BT dependency
** Prod dependency
Implementation

- The Implementation Phase is the formal engagement between TCH and Client regarding connection to Client’s infrastructure and test readiness for go-live
- TCH Client Services and Client will collaborate to complete all relevant onboarding forms
- TCH will assist Client in ensuring all infrastructure needs are met
- Client will be able to test within TCH’s Bank Test environment
- Client will be promoted to Production which is contingent on all requirements being met including certification
- Key activities during the Implementation Phase:

  **Onboarding Forms**
  - TCH and the Client will work together to review and complete all relevant onboarding forms

  **Infrastructure**
  - Ordering and installation of circuits (if applicable)
  - Shipping & configuration of routers
  - Ensuring security criteria is met

  **Testing/Go-Live**
  - Performance of end-to-end testing
  - Fulfilling certification criteria
  - Execution of final Participation Agreement and Submission of the Fed Funding Letter
  - Go-live

**TOLL-GATE:** TCH will work with the Client to ensure Funding Letter has been submitted and all Certification Criteria have been met prior to Go-Live.
Certification Test

1. **Scenario-based Section**
   - Demonstrate that Participants can exchange messages with RTP and adhere to all RTP message formatting and processing rules, based on their profile (receive-only, send & receive, etc.)
   - Criteria of messages to be tested, based on profile, is available now.

2. **Live-flow Section**
   - Demonstrate that Participants can process control and administrative messages and other events in the course of processing standard RTP message activity.
   - *Not* a stress-test or TPS performance test.

3. **Exception Handling Section**
   - Demonstrate that the Participant can handle exception scenarios, recover from any failure scenarios, and resume normal processing in a reasonable period of time, and demonstrate that their system reflects the Current Prefunded Position at the end of the exceptions handling test.

- Scheduled no earlier than 30 days ahead of Go-live
- Actual Certification Test executed in Bank Test environment (not Production)
- Test itself taking 2-5 hours
- If Participant’s profile changes (adds supported messages) then will need to fully recertify
Key Lessons Learned – to date

- Order Circuits Early: Circuit Installations taking longer than expected
  - TCH works with AT&T Services for both primary and secondary circuits. Usual guidance has been these take 8-10 weeks from order to installation. Reality has been longer, as there can be unforeseen problems.
  - No more space on data center panel to tie down new circuit
  - Tech refused entry to data center
  - Actual LEC at datacenter not very responsive to AT&T

- Make a test plan in advance: TCH has limited resources to aid in testing
  - Banks that are “receive only” are relying heavily on TCH for launching messages to them for testing
  - Due to multiple banks and partners needing assisted testing time, TCH Client Services & Operations can schedule just 2-3 one-hour sessions per week for each
  - Due to manual nature of testing, and any preparation that TCH Client Services/Operations may need to have put in place, TCH needs 1-2 business-days notice of testing plan for next session.
  - Temptation to debug on the testing sessions eats up time.
  - Plan on more testing time than anticipated
Further Key Lessons

• Those who are building (vs. buying) all traverse a learning-curve with Message Specs and coding mistakes
  – Fully understanding the Message flows and nuances of the Message Specs takes some time.
  – All camt.056 messages must be acknowledged, regardless of original date, or details. Otherwise, they will be repeated every 30 seconds and clog queues
  – Some fields that contain “time” value will need milliseconds and will not. At this time, the syntax is unforgiving – should become better with next release.

• System Notification Messages (SNMs)
  – There are a lot of system admin messages flowing – develop a strategy for what to log, for how long, (or not log) so that you don’t clog databases or log files.
  – Be sure to use the SNM details of when other participants are signed off or unavailable, and appropriately indicate to end-users when their attempted payment or message can not reach the participant at that time. Suggest alternate delivery mechanisms?
  – Respond to all echo messages. After 3 failures to respond, your participant will either become partially or fully unavailable, and that will be broadcast to network.
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