



May 2023

Developing a Comprehensive, End-to-End Testing Strategy for the T+1 Accelerated Settlement Cycle

*The Securities Industry and Financial Markets Association (SIFMA), the Investment Company Institute (ICI), and The Depository Trust & Clearing Corporation (DTCC) have been working to accelerate the U.S. securities settlement cycle from T+2 to T+1. **On February 15, 2023, the SEC adopted final requirements for a May 28, 2024, implementation date for the move to T+1 settlement**¹. Moving settlement to one day after the trade (T+1) will likely have a significant impact on the capital markets industry and market infrastructure, particularly for settlement business functions and technologies.*

*Organizations should consider developing and executing comprehensive test plans that align with an aggressive T+1 Testing schedule. Testing will need to be performed **iteratively throughout implementation** to achieve readiness for the migration to T+1. This includes **internal system testing, vendor and service bureau integration testing, and industry testing** to be completed with the DTCC.*

T+1 Drivers and Key Considerations

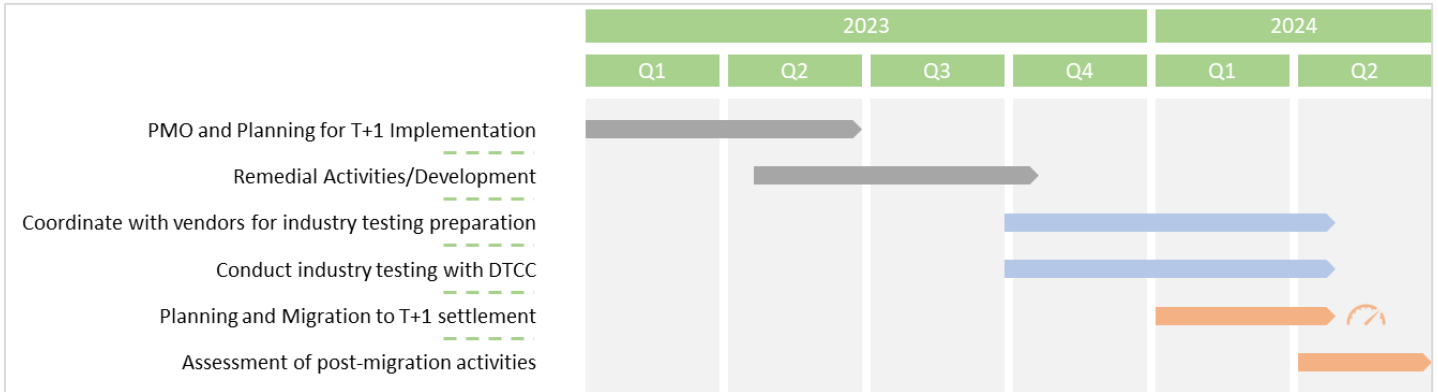
- Industry transition to the T+1 settlement cycle will have a **much broader impact** than the previous T+3 to T+2 transition
- Batch cycles based nightly processing will need to be significantly automated, allowing trade processing to be **as close to real time** as possible
- System **resiliency testing** and improved failover capabilities will be required to minimize the impacts of system outages
- **Testing strategies and SLAs** will need to be developed with third party participants to ensure accelerated timeline requirements are met for T+1
- **Several iterations of testing** will be necessary for participants' internal systems, integrated vendor products, DTCC, Exchanges and other Industry players
- **Manual trade fixing**, and resolution of exceptions, during the trade settlement cycle will need to be automated, to meet accelerated timelines
- **An overarching automation strategy** will be necessary, addressing technology systems and data across all product categories, including reference data, standing instructions, corporate actions, securities lending, repo, collateral and liquidity management, trade funding, and payments

T+1 End-to-End Testing Readiness Requirements

- Market participants will need a comprehensive and well-coordinated **end-to-end testing to confirm industry readiness** and ensure a successful T+1 implementation
- The industry infrastructures participating in the industry test will include DTCC's subsidiaries: **ITP, NSCC, and DTC, as well as exchanges CBOE and Nasdaq, and the OCC**. Participants will need to draw specific Test scenarios by Asset class to ensure testing covers each of the Industry participants
- Industry Tests will need to occur during regular business days on DTCC test environments
- DTCC will assign **specific CUSIPs** to create various scripted test conditions, such as: Common Stock, Corporate Bonds, Municipal Bonds, CNS and non-CNS-eligible CUSIP (multilaterally netted or bilaterally netted), Corporate Actions, etc.
- Industry Testing should include **vendors and service bureaus**
- DTCC will utilize its existing test environment for T+1 industry testing. This test environment will support all NSCC, DTC, and ITP T+1 industry testing requirements
- All in-scope **Asset classes** will need to be tested: Equity trades, Corporate bonds, municipal bonds, UITs, and ETFs: Create and Redeem processes

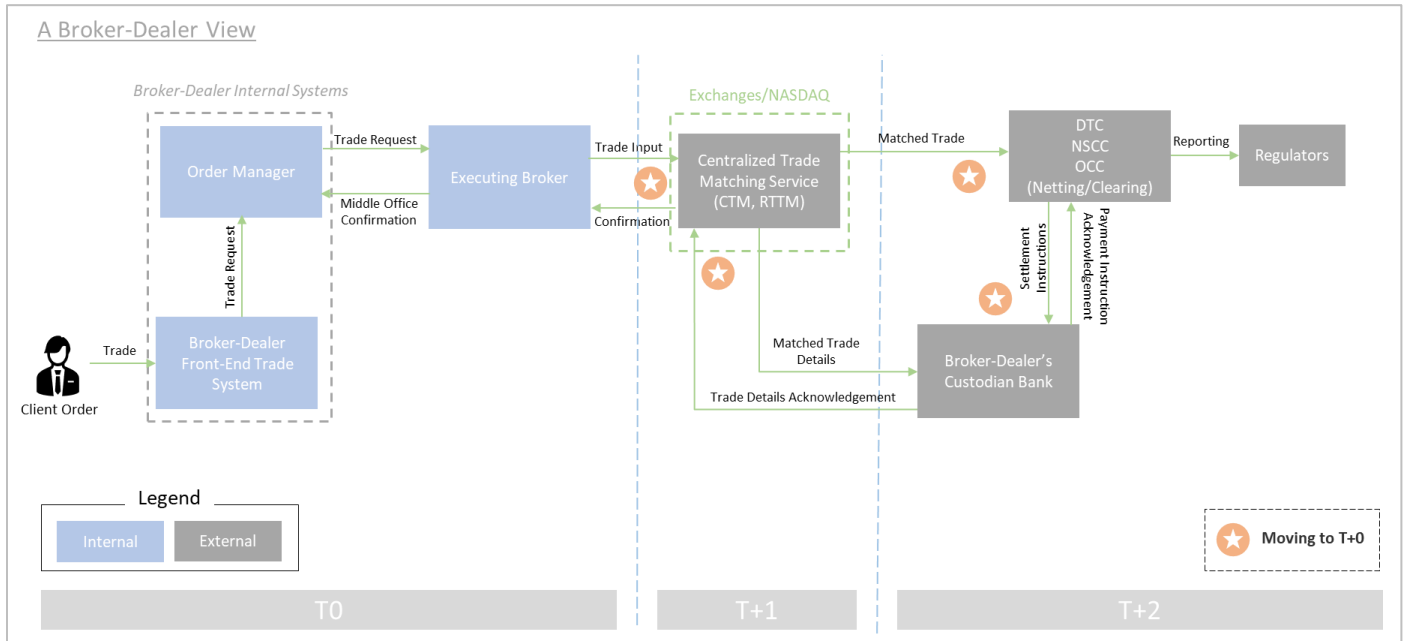
¹ Reference: [Shortening the US Equities Settlement Cycle | DTCC](#)

T+1 Migration Roadmap



The timeline above outlines the path for market participants transitioning to T+1, with activities organized across implementation, industry testing, and Go-Live. Market participants should use this timeline to assess and plan firm-specific readiness activities in parallel with other industry parties. T+1 Testing cycles should be planned to initiate from the end of Q2 2023, to grant roughly eight months of testing before the May 2024 Go-Live.

T+1 Testing and Trade Life Cycle



As outlined above, the entire trade life cycle will need to be tested, including, but not limited to trade affirmation, confirmation, clearance, settlement, and trade exception flows. For example, trade allocations in the T+1 settlement cycle will need to be completed by 7:00PM ET on trade date (T) to ensure that market participants have sufficient time to process their confirmations and affirmations by the DTCC affirmation cutoff of 9:00PM ET on T. Similarly, each integration point, both internally within the Market participant ecosystem and externally with Industry participants, will need to be tested and validated to ensure that accelerated timelines are met.

High Level Industry Testing Scenarios for T+1²

A careful review of internal systems, including batch cycle limitations and manual touch points will be necessary to develop a comprehensive set of detailed test cases, aligned to the set of high-level test scenarios outlined below. Per the guidelines provided by DTCC, as a part of Industry testing, participants will be able to submit test trades to Nasdaq or Cboe for execution. Executed trades will be submitted to NSCC for clearance and to DTC for settlement. For institutional activity, participants will be able to submit test transactions to ITP and have the matched transactions processed through NSCC and/or DTC for clearance and settlement. Participants will be able to exercise open option contracts in the OCC's test environment and have the corresponding option trades sent to NSCC for clearance as part of the OCC exercise and assignment (E&A) process.

Industry Participants	High Level Test Scenarios	Asset Classes Involved
National Securities Clearing Corporation (NSCC)	Trade Matching	Corporate Bonds, Municipal Bonds and UITs
	Trade Clearing (CNS Eligible CUSIPs, non-CNS Eligible domestic CUSIPs, CUSIPs eligible for Foreign Securities Netting)	ETFs and Stocks
	ETF Creation and Redemption	
	Trade Affirmation – Enrichment Matching Trade eligibility	ETFs
	RTTM Trade matching for CNS-eligible CUSIPs	
	RTTM Trade matching for non-CNS “Regular Way” and “When-Issued” trades in new Municipal Bond issuances	Corporate Bonds, Municipal Bonds and UITs (CMU)
Depository Trust Company (DTC)	Regular Way and Irregular Way Ex-Date processing	Capital Gains, Special Dividends, Liquidations
	IVORS Redeem and Rollover at TA or Sponsor	
	PTOP and PSOP Cover / Protect Processing	
	Double Settlement Day (Bank Holiday, first T+1 settlement day)	Stocks, ETFs CALL and PUT for Contracts (Buy to open, Sell to Close, sell to open, Buy to Close)
	CNS eligible Trades undergoing a Voluntary Corporate Action Event	T2T segment stocks
	CNS eligible Trades undergoing a Dividend Distribution event	
	Prime Brokerage and Securities Lending related scenarios	
	Asset Servicing related scenarios	All Security Types
Trade Settlement failure scenarios		
Chicago Board Options Exchange (CBOE)	Trade Execution and Trade Settlement	All Security Types
NASDAQ	Trade Execution and Trade Settlement	All Security Types
Options Clearing Corporation (OCC)	Full lifecycle of Options trades	Options
Institutional Trade Processing (ITP)	Trade Matching for ID Net eligible, Prime Broker (CNS) and Non-ID Net (PDQ) trades utilizing Regular Way CUSIPs	Equity and Fixed Income
	Trades with non-DTC settlement location	
	Trades in 'When-Issued' securities	
	Special handling cases (Broker Cancels ID Net Trade, ID Net trades does not settle)	

² Reference: DTCC T+1 Test Approach: Detailed Testing Framework

T+1 Testing Challenges and Potential Remediation

T+1 Testing Challenges

How can Deloitte Help?

Our Value Proposition



Testing Strategies and Support

Holistic testing strategy, encompassing internal, reciprocal client, and industry testing

We bring best practices and proven Test Governance and Frameworks for detailing test activities, entrance and exit criteria, key milestones, test cycles, roles and responsibilities



Test Design and E2E Test Scenario Suite

Drafting and analyzing test scripts, cases for front to back-office and industry testing cycles specific to T+1 acceleration

We have developed a T+1 ready Test suite of 150+ "plug and play" test scenarios which could be easily deployed in your Test environment, giving you a head start!



Internal, Industry Testing

Front to back integration testing encompassing Connectivity, APIs, Middleware-based testing, early in the lifecycle

We bring a highly skilled pool of technology and industry experts who could work with your SMEs to customize internal and industry test cases to your needs



Test Automation

Build-out of automation frameworks & test cases to maximize coverage, enable shorter testing cycles and on-demand execution

With an 'Automation First' mindset, we will deploy our proven automation frameworks optimizing value through automation and reducing costs of testing cycles



Data and Test Environment Management (TDM)

Data Quality (Critical Data Elements, Lineage, Consistency & Accuracy), Setup, Service Virtualization, End-to-End Test Infrastructure

We have vast experience in defining and executing a centralized TDM approach to address test data challenges and accelerate test data setup by leveraging our in-house tools and accelerators



Resiliency Testing

A critical component of recovery, resiliency plans to account for the ability of applications/ systems to recover within T+1 timelines

With our Application performance tools and monitoring tools, we can help identify the bottlenecks across batch cycle integration points and suggest remediations

Domain Thought Leadership

- SIFMA, ICI, and DTCC published The T+1 Securities Settlement Industry Implementation Playbook. Deloitte & Touche LLP was engaged by SIFMA and the ICI to assist in drafting this Playbook. Deloitte has been at the forefront of assisting SIFMA through working group sessions and studying T+1 and its impacts/feasibility
- Published the industry report with SIFMA leadership providing recommendations and the roadmap to accelerate the T+1 transition

Highly Skilled Professionals

- 2600+ quality engineers delivering Next Gen QE services in 125+ global delivery centers
- 77% of testing practitioners certified in ISTQB/CSQA and other testing specific certifications
- Deep subject matter knowledge and relevant Capital Markets industry insight from our highly experienced team

Tools and Accelerators

- Strong relationships with market participants and vendors across trade lifecycle and test management, performance, automation, and other emerging solutions within the QE space
- Repository of 150+ reusable test scenarios for T+1 Settlement changes.
- AI/ML and NLP-based QE solutions to maximize test automation
- Industry leading experience in testing across strategy and innovative technologies
- Our Alliances: Deloitte has long-standing and alliance relationships with leading vendors (e.g., GenRocket Microfocus, Egg Plant, TDiB)

Unparalleled, Industry-Wide, Transformation Experience

- Valuable insights, stemming from T+1 gap assessment collaborative research, on industry peers and their operational challenges
- Delivering end-to-end business transformations, as well as niche projects in the Capital markets space
- Strong experience from T+2 implementation support to market participants across geographies

Key Considerations across T+1 End-to-End Testing



System Test: Performing test configuration & business logic of individual systems (Settlement systems and other affected applications) independently for T+1 changes



Performance Test: Performance tests of Webservices, Cloud apps, if applicable, to ensure they can handle data volume in an accelerated timeline.



System Integration Test: Test integrations between applications (Settlement systems and other affected applications) which is impacted due to T+1 workflow



Industry Testing: Testing with industry participants (DTCC, NSC, Exchanges, Custodians, OCC, and others), utilizing DTCC-provided CUSIPs



Batch Testing / Data Testing: T+1 data impact due to Batch Cycle dependencies (Prior to day cycle, nightly, misc.), Data Recon, Data Validations



Resiliency Test: System resiliency should be evaluated and tested, given that the reduced processing window may require improved failover capabilities to reduce the impacts of a system outage



Regression Testing: Test the end-to-end trade life cycle for selection of specific T+1 scenarios

The move to T+1 is expected to create significant risk reductions for all market participants, enable cost savings, and lower margin requirements. That said, it will need a fundamental change across business operations and underlying technology to enable accelerated settlement processing. **A carefully planned out and effectively executed end-to-end testing will be pivotal to ensuring a successful T+1 migration.**

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