



HiPortfolio/3 Roadmap 2015

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Background

Our product development is guided by our understanding and views on industry trends, regulatory changes and technological innovation informed through interaction with clients, prospects, industry commentators and consultants.

The HiPortfolio roadmap comprises detailed items in the imminent releases that provide our 12-18 month plan. Thereafter, we have items that provide the longer term vision 18-36 months out comprising our view of future needs and subsequent priorities around which we are actively engaging with our clients.

Roadmap items represent programmes of work to ascertain detailed business requirements and assess options to enhance HiPortfolio's capability to service the needs of our clients.

We update our Roadmaps twice yearly and share these with clients through our relationship management processes and also publish the roadmap on the web based Client Centre.

Roadmap

	Investment Accounting		Operational Efficiency			Regulation	Technology		
	Investment Strategies	Taxation	Corporate Actions	Unit Pricing & Reconciliation	Data Presentation	Regulatory & Reporting	Integration & Data Management	Platform & Deployment Initiatives	Architecture & Framework
2015	<ul style="list-style-type: none"> FI Amortisation Multi-exchange Rates Repos Stock Lending Syndicated Loans Fund Transitions 	<ul style="list-style-type: none"> Franking Credits Managed Investment Trusts Net WHT Reporting Pension Segregation TOFA Enhancements 	<ul style="list-style-type: none"> XSPRIS integration Automated Processing of Collectives 	<ul style="list-style-type: none"> Reconciliation User Interface Unit Pricing User Interface Unit Pricing Optimisation 	<ul style="list-style-type: none"> Business Operational Dashboards Exceptions Management 	<ul style="list-style-type: none"> Real time position keeping Regulatory Reports 	<ul style="list-style-type: none"> Data Extraction Database Initiatives with Partner Vendors Enterprise Integration via Events Framework External Task Agent Queuing SS&C Product Suite Integration 	<ul style="list-style-type: none"> Database Backup and Disaster Recovery Database Upgrade Performance Optimisation Deployment Models Hosted Deployment 	<ul style="list-style-type: none"> Event Message Broker & Framework JVM HiPortfolio Speed and efficiency
2016 +	<ul style="list-style-type: none"> Fund Transitions 	<ul style="list-style-type: none"> TOFA Enhancements 	<ul style="list-style-type: none"> Automation of Investment Accounting for Electives 	<ul style="list-style-type: none"> Data Locking & Snapshots 	<ul style="list-style-type: none"> Business Operational Dashboards Exceptions Management 	<ul style="list-style-type: none"> Global, Market & Regime Support Regulatory Reports 	<ul style="list-style-type: none"> Database Initiatives with Partner Vendors Enterprise Integration Leveraging Events Extended CC-API coverage SS&C Product Suite Integration 	<ul style="list-style-type: none"> Linux Program Isolation 	<ul style="list-style-type: none"> JVM HiPortfolio Business Function Services & Web Services Error Framework Speed and efficiency

Committed Items

Version 15.0

Category	Item	This enhancement...
Investment Accounting	Investment Strategy	
	Multi Pricing	Allows the Security Export program to export prices using a reverse alphanumeric method and allows Security Export API jobs to select a price selection method using the Multiple Pricing sources (MP) module when the price selection tag is undefined in the job's xml file.
	Net Payment on Swaps	Provides the ability, when processing the net interest on either leg of an FI-21 Swap security, to: <ul style="list-style-type: none"> process both legs of the swap simultaneously calculate the TOFA accrual and gross the net interest cash for both legs when the same due dates apply to both legs of the swap. Clients implementing this solution will find that the FA module can support the way interest is processed for swaps in the market, as HiPortfolio now calculates and reports interest for both legs when interest is advised as a single net amount.
	Trading FI and CN by Lots	Makes the following changes: <ul style="list-style-type: none"> adds additional audit messages to the following imports: <ul style="list-style-type: none"> Security Master Open and Executed Orders On/Off-market Transaction Settlement changes the behaviour of the Lots fields to display a zero and not a blank enhances the Number of Lots field changes five FIX programs.
	Franking Credits	Introduces a new module, Franking Credits Entitled Only (F1) so that clients can determine a date from which only entitled acquisitions are matched for LIFO. In line with guidance provided by the ATO, The Franking Credits LIFO matching methodology has been enhanced to allow for both the old and new methodology to be applied.
	Taxation	
	RITC Rates for Portfolios	Changes the way Reduced Input Tax Credits, (RITC) rates are maintained and applied to analysis codes, by making it possible to maintain RITC rates at a tax entity and analysis code combination level.
	Tax Lots Clean-up	Adds additional DRO capability across Multi Pricing.

Operational Efficiency	Corporate Actions	
	Dividend Schedule Audit Change	Allows amendments to the ex-date or due date to be treated as a schedule change rather than a delete and add record, only when the CA source code and CA Identifier fields are provided with the dividend schedule.
	XSP.Txn Entity	Is for clients with a requirement to keep the position data between HiPortfolio and XSP in sync. It requires the implementation of the CA Integration XSP Equity (X1) module.
	XSP Transaction Extract – Phase 2	Allows HiPortfolio to integrate with the new XSP Trades and Positions (T&P) module functionality that was introduced by SunGard.
	Corporate Actions Configuration	Makes several changes to the corporate actions XSP functions, so that: <ul style="list-style-type: none"> the corresponding security code types for related securities are exported by identifier type for a country of issue individual securities can be excluded from a security export to XSP ISIN codes used by multiple securities are unique for each security special characters can be sent to XSP from HiPortfolio.
	Mapping Change for Merger	Changes the XSP.CorporateActions entity to perform the following actions when it creates the IDX capital announcement import record for HiPortfolio: <ul style="list-style-type: none"> validate the XSP Treatment of Holding tag and select the appropriate Shortlisted HiPortfolio Event Code map the source percentage value provided by XSP to the Source percentage field map the values provided by XSP in the new Cost Apportionment Factor tag, for each of the target securities, to the Target cost apportionment field on the Capital Announcement Import Record validate that the cost apportionment factor values provided are equal to the value in the source percentage tag split the default cost apportionment ie, 1 (100%) equally over the number of target securities defined in the message file if, the cost apportionment factor is not provided or is blank in the XSP message file, and the Treatment of holding field on the Event Maintenance window is set to Destroy for the event.

	Allow Pending Approval Workflow Status from XSP	Changes the integration between XSP and HiPortfolio to also accept messages where the workflow status is set to Pending Approval (PA) on the corporate action announcement in addition to the existing workflow statuses currently supported in the solution.
	GBP Dividends Mapping Change	Provides the ability to import or calculate the net amount for dividends when the tax currency is GBP, and both the gross amount and net amount are provided in the XSP file.
	CFI Codes and FAM	Provides the ability to support both XSP 9.6.1 and 10.1 formats and to match capital events based on the XSP Fund Accounting Module (FAM) fields when they are provided in the announcement. It also provides support for capital events that provide a zero or blank value cash payout type, such as rights issues, and provides support for accumulated collective events that have a zero or blank equalisation rate. The XSP.Security extract has also been modified to allow a security to be classified by CFI code.
Unit Pricing & Reconciliation		
	Report Creations and Liquidations	Provides the ability to report on outstanding creations and liquidations at a sub portfolio level, when the sub portfolio is not unitised, but is linked to a unitised propagated portfolio that has outstanding creation and liquidation transactions. Clients implementing this solution can report on cash balances at a sub portfolio level, when the sub portfolio is not unitised and linked to a unitised propagating portfolio.
Regulation	Regulatory & Reporting	
	US Regulatory Reporting	Ensures the quarterly and annual regulatory reports for all US accounts and year end reports for US entities meet the US Regulatory requirements as defined by NAIC.
	2015 US Regulatory Quarterly Changes	
Technology	Integration & Data Management	
	Data gaps between IDX export and DROs	Provides the ability to extract available data using IDX On-market transaction export and IDX Executed orders export though the use of new and enhanced data objects.
	GST Adjustments Export	Adds the ability to extract GST adjustment (GSTADJ) transactions from HiPortfolio to populate a data warehouse (DWH).
	DRO Performance Improvement	This enhancement: <ul style="list-style-type: none">retrofits QUICKINDEX data objectimproves the performance of VALUATION and VALUATIONNOANAL data objects

	Cash Source ID in OpenInterface Transaction Export	<p>Ensures that when you export transactions using the OpenInterfaces Transaction Export the interfacing of ITR and STT identifiers is consistent between HiPortfolio and Anova.</p> <p>Clients implementing this solution will be able to identify cash and settlement transactions (CTR and STT) 7 digit identifiers that have surpassed 9999999 using an alphanumeric identifier and continue to identify investment transactions (ITR) using 10 digit numeric identifiers when 7 digits is surpassed.</p> <p>After implementing the functionality introduced by this enhancement, clients will be able to consistently reconcile CTR, STT and ITR identifiers between HiPortfolio and Anova.</p>
	Details of Deleted Events	<p>Changes the IDX Capital Announcement Import process to:</p> <ul style="list-style-type: none"> • populate the details of the event being deleted as a result of a change to the announcement schedule, on the CAPITAL ANNOUNCEMENT IMPORT AUDIT report • return the message containing the details of the event that is being deleted to the DIF, so that the ACK/NACK messages reconcile with the audit report • modify the wording of the message that displays when a new announcement record is processed as a change record and an existing matching record cannot be found.
	DRO Expansion	<p>Enables clients to mimic certain Tax RG reporting using DRO, without the need to create several JOINS in the SQL queries and therefore avoiding any negative impacts in performance.</p> <p>Clients implementing this solution will be able to use the following DROs to mimic tax reporting RGs : INVESTMENTTRANSV04, V05, V06; VALUATION, VALUATIONANAL; SECURITY</p>
	Administrator Programs and DRO Functions	<p>Implements various administrator programs and DRO functionality introduced in HiPortfolio/3 version 3.8d, but not in later versions.</p>
	Batch Auditing	<p>Provides the ability to audit batch activities through the implementation of a new Database Audit (UD) module parameter, several new reports and DROs.</p> <p>Clients implementing this solution will be able to determine whether batch activity is audited in their system and generate reports showing that activity.</p>

Immediate Priorities for 2015

Investment Strategies

Franking Credits

Arising from ongoing internal and industry wide discussion, concern has been raised about whether the current HiPortfolio LIFO matching methodology is in line with the legislation. The specific concern relates to matching post ex-date sales against post ex-date purchases that do not form part of the original dividend entitlement, thereby understating the amount of franking credits that should be denied. This issue has now been clarified in a guidance paper published by the ATO, see link below:

[https://www.ato.gov.au/Business/Imputation/In-detail/Dividends---imputation/Applying-the-last-in-first-out-\(LIFO\)-rule/](https://www.ato.gov.au/Business/Imputation/In-detail/Dividends---imputation/Applying-the-last-in-first-out-(LIFO)-rule/)

This guidance paper requires that only acquisitions containing an entitlement to the franking credit be included for LIFO matching purposes, using a two-step process to be applied where:

- 1 – Match on a LIFO basis trades before ex-date to establish entitlement parcels
- 2 – Match post ex-date sales to entitlement parcels.

HiPortfolio currently includes both those with and without an entitlement to be part of the LIFO update.

SS&C is working with all Tier 1 clients in the Australian region to deliver the changes required to HiPortfolio to comply with the ATO guidance.

Repos

A repo (also referred to as a repurchase agreement) is an agreement for the sale and then re-purchase of a financial asset at a future date, with the contract involving a component of a charge called repo interest/yield. A repo for one party is a reverse repo for the opposite party.

Enhancements to how these events are recorded in HiPortfolio and improvements to processing and reporting capabilities around these events are being considered. Changes to this area would ensure clients could more efficiently achieve transparency in reporting, as well as correct tax and accounting treatment.

Stock Lending

Stock lending is becoming increasingly popular in both the Chinese and Thai markets. SS&C is working with clients in these countries to look at ways to manage the stock lending process in line with their market requirements.

Syndicated Loans

A syndicated loan is a type of credit offered by a group of lenders (called a syndicate) who work together to provide funds for a single borrower. The borrower could be a corporation, a large project, or sovereignty (ie, a government). The loan may involve fixed amounts and terms, or a credit line (revolving loan facility), or it could be one or more of each of these types of borrower under a single credit facility. If a borrower requires a large or sophisticated facility of different types of loans, a syndicated loan simplifies the process for the borrower as a single agreement covers the whole group of banks and types of loans.

For the lenders, the benefit of syndicated lending is to spread the risk of a borrower default across multiple lenders or investors. Syndicated loans have also gained popularity as an investment vehicle in the current post GFC environment where the bond market has gone flat.

At the start-up of the facility, each lender agrees to a commitment amount that is based on a percentage of the total agreed facility amount (the facility can also be broken down into tranches – as described below). With time, the total amount of the facility/tranche can change. This will often vary the commitment percentage but not the commitment amount. It is also possible to vary the commitment percentage with time

This roadmap item covers analysis of the ability to process syndicated loans from the lender side within core HiPortfolio functionality that extends to:

- Maintenance
- Pricing
- Transaction processing
- Valuation and reporting
- Accounting
- Tax

Fund Transitions

SS&C, through the advisory board, is writing a white paper outlining the phases of the Fund Transitions process and the opportunities we believe can be serviced, as well as indicative sizing of the effort involved to service them. Once the paper has been circulated, further detailed workshops will be scheduled to prioritise the functional areas our Tier 1 Australian clients wish to focus on, as well as gather detailed requirements from those participating.

SS&C will then establish a joint roadmap with our clients and target delivery of software accordingly.

Taxation

Taxation of Financial Arrangements (TOFA)

SS&C continues to:

- monitor on-going revisions of the TOFA legislation, through participation in the ACSA Tax Working Group.
- assess the potential impact on the client base as these changes are released.

The two major industry initiatives at this stage are:

- TOFA deregulation review
- ATO Request for Proposal to the Big 4 accounting firms

SS&C will hold further TOFA specific Special Interest Groups (SIGs) for the prioritised candidates in Q2 2015. The focus of this group will be to agree the priority of roadmap items and the model for participation to take candidates forward as an interest group.

Net of WHT Reporting

For valuation reporting in HiPortfolio, the engines all include WHT in the stated valuation output. Clients (specifically in EMEA), are looking to report these values Net of WHT as this takes into account the liability against the valuation.

SS&C is working with a number of clients in EMEA to finalise requirements and design a solution that will provide the ability to report valuation data net of WHT, through the Report Generator, Unit Pricing, Business Intelligence and Data Objects.

Managed Investment Trusts (MITs) – new tax regime in Australia

The proposed new tax system for managed investment trusts (MITs) will modernise the tax rules for eligible MITs and increase certainty for both MITs and their investors. These new rules will enhance the international competitiveness of Australian managed funds and promote the greater export of Australia's funds management expertise.

The exposure draft legislation has been developed in close consultation with key stakeholders in the managed funds industry.

The key features of the new tax system for eligible MITs include:

- an attribution model for determining member tax liabilities, which allows amounts to retain their tax character as they flow through an MIT to its members
- the ability to carry forward understatements and overstatements of taxable income, instead of re-issuing investor statements
- deemed fixed trust treatment under the income tax law
- upwards cost base adjustments to address double taxation
- legislative certainty about the treatment of tax deferred distributions.

Treasury released an exposure draft law for the proposed new tax system for certain eligible managed investment trusts (MITs) on 9 April 2015. This exposure draft law states new rules for MITs will apply to income years starting on or after 1 July 2015. However, at this stage a compulsory start date of 1 July 2016 is under discussion.

SS&C will continue working with industry associations and the client base to analyse the impacts and assess any necessary changes to HiPortfolio.

Pension Segregation - Australia

Superannuation Fund members can either be in an accumulation or pension phase. Each phase has a different tax liability consideration. For example, Income (including capital gains) earned by a fund and used to pay members a pension phase income stream are exempt from tax. The Superfunds lodge tax returns which have to identify exempt income for those members in a pension phase, by either splitting income based on actuarial certification, or by holding assets separately.

With an aging population in Australia, and more members moving into the pension phase, this problem is compounded for administrators. Pension Segregation is a process where a fund undertakes to move from use of common assets to the use of separate portfolios for the accumulation and the benefit phase members. Members moving from accumulation to pension phase may transition their assets within the fund without triggering a tax event. The resulting tax benefit may be passed onto the member.

SS&C is currently assessing the broader market and client specific requirements to facilitate this process with the Australian client base.

Corporate Actions

XSPrisa Integration

SS&C has partnered with SungardXSP, an expert Corporate Actions vendor. Full integration between HiPortfolio and the XSP stand-alone application has already been delivered through previous versions of HiPortfolio (ie, 13.0 and 14.0).

XSPrisa is offered as software as a service (SaaS). It leverages the power and agility of the XSP v5 platform to quickly and cost-effectively simplify corporate actions process. XSPrisa supports inbound DTCC 20022 data as well as SWIFT ISO Messaging for ISO MT564/568 and Outbound MT565.

The XSPrisa initiative is to analyse, define requirements and build capability to integrate to the XSPrisa product offering.

SS&C will continue to work with our partner SungardXSP to deliver these capabilities through future releases of HiPortfolio to meet market and client demands.

Automated Collectives Processing

This project will enhance HiPortfolio's integration to XSP, allowing the estimated dividends for collectives to flow through from XSP into HiPortfolio.

Currently integration is setup so that both the dividend value and the equalisation rate are supplied for the collective. Market data providers use this information to advise, in the first instance, the estimated distribution value. As a result, the equalisation rate is not supplied until a later stage, closer to the ex date, when it is known.

Enhancing the XSP/HiPortfolio integration will support the automation of timely market flow data.

Unit Pricing & Reconciliations

Unit Pricing User Interface

The introduction of the HiPortfolio Web UI enables the provision of flexible and configurable user interfaces for a variety of business functions. This project will explore and validate options to display UPW exceptions, through a tailored Web UI. A wider programme of exceptions management will also be explored, including direct integration with HiPortfolio's Reconciliation capability. Leveraging the new Events framework, these new dashboards would be driven by direct notifications published as Events from across the HiPortfolio system.

Data Locking & Snapshots

This project will explore options that enable HiPortfolio to be the single source of truth for all investment accounting data, whereby positions and reference data can be reproduced at a specific point-in-time for unitised and non-unitised portfolios. Locked data could be used for processes such as unit pricing, reporting and reconciliation.

Data Presentation

User Interface Initiatives

SS&C is constantly looking to improve the standard look and feel of the HiPortfolio user interface (UI) and is investigating ways to leverage the SmartClient infrastructure within HiPortfolio's Web UI, exploring options to provide functionally rich user interfaces to replace existing HiPortfolio screens.

This should enable a standard look and feel to the HiPortfolio product, when users interact through a browser based screen. A browser based interface will also allow for easier deployment to a client workstation, potentially reducing cost of ownership to the client.

SS&C are looking to also leverage existing infrastructure and products through the broader SS&C product suite, where possible.

Business Operational Dashboards

Building on the SmartClient infrastructure within HiPortfolio's Web UI, this project will provide a centralised view of operational checkpoints for key HiPortfolio business processes.

There are two main aspects to the operational dashboard:

- the ability to display, for a range of processes, the status of an individual process based on defined criteria and underlying information
- the ability to generate notifications/alerts based on defined criteria, ie, manage by exceptions

Additionally, the ability to capture and analyse trends in meeting operational milestones will assist clients in actively managing operational workflows and triggering continuous improvement.

SS&C is investigating options within the current Business Intelligence and Operations Monitoring Dashboard (Demo version available), as well as the SS&C product suite to service this need.

Advanced Reporting (including leveraging Anova)

SS&C's Anova product allows the aggregation of data from multiple sources with advanced and flexible reporting capabilities. SS&C will explore options to leverage this capability, either directly within HiPortfolio or through a fully integrated HiPortfolio-Anova offering.

SS&C is also undertaking analysis of the SS&C product suite to service this need.

This initiative will continue into 2016.

Market Regulatory

US Regulatory Reporting

All insurance companies undertaking business in the United States are required to file financial reports. The reporting regulations are defined by the National Association for Insurance Commissioners (NAIC). SS&C continues to track regulatory changes as they vary from year to year and align HiPortfolio capability with the most up to date guidelines issued by NAIC.

Real Time Position Keeping

SS&C is currently working with EMEA clients to understand and define their requirements for real-time position keeping within HiPortfolio, and the ability to feed external systems with real time positions through incremental updates.

Integration & Data Management

Data Extraction

This initiative is focused on aligning the SS&C toolkit with our clients' Data Extraction requirements, and developing a strategy for SS&C clients to leverage.

Currently, HiPortfolio has multiple options to extract data. This includes, but is not limited to RG, DRO and IDX. The data extraction also needs to interact with a message broker to compliment the Events infrastructure component.

Enterprise and Data Integration Framework Extensions Building on Current Capabilities

The HiPortfolio Data Integration Framework (DIF) makes use of an existing application template that forms part of SS&C's broader product integration strategy. The HiPortfolio DIF can potentially be leveraged to solve wider integration challenges specific to client demand. This project will continually assess client integration requirements and explore opportunities to enhance the DIF capability to meet needs.

With the introduction of the Event Notifications in 14.0, SS&C will continue to explore opportunities to build out additional event coverage aligned to integration opportunities, based on client and internal integration demands.

Database Initiatives with Partner Vendors

Database Partitioning

Database partitioning allows administrators to split databases across separate environments.

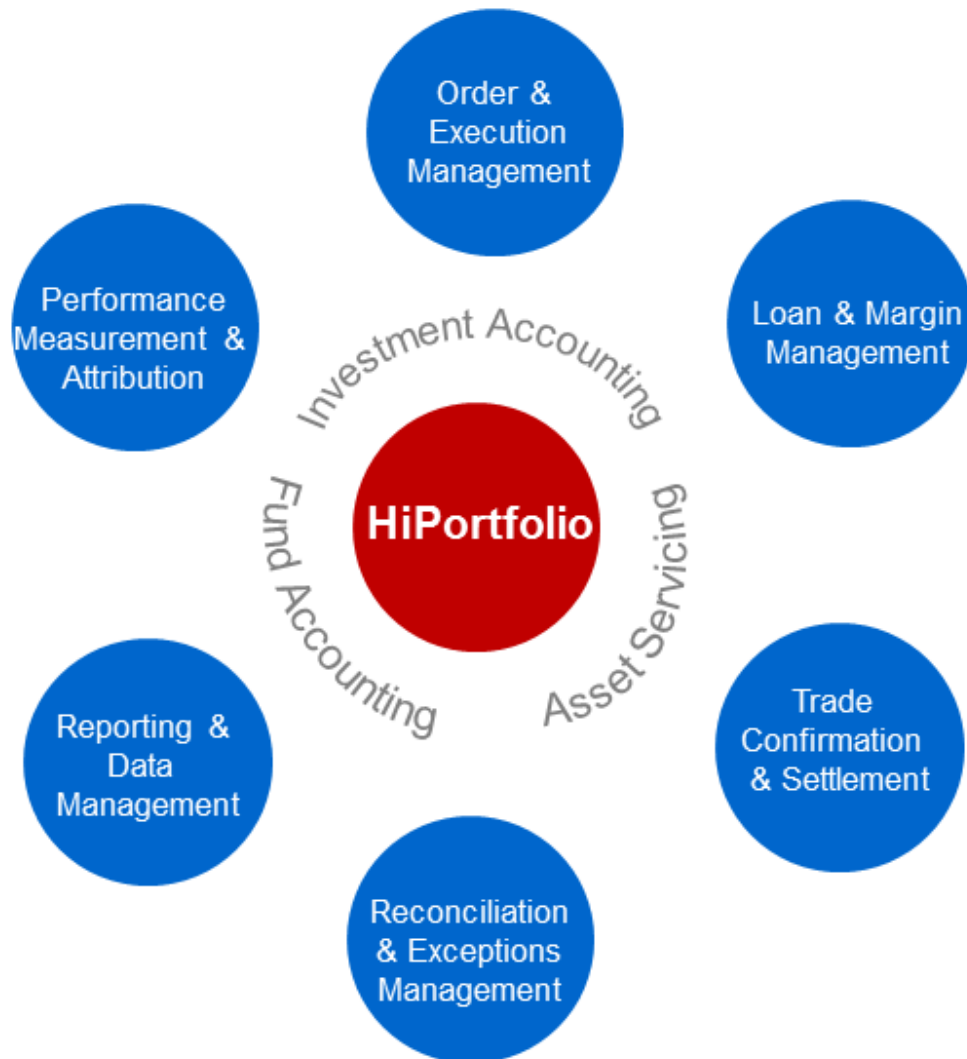
Partitioning could provide many benefits, ranging from potential performance improvements to more flexible management of the database storage (ie, allowing clients to split old data onto slower/cheaper storage, and new data on faster storage). This would allow administrators to archive real-time data based on rules based configuration.

Continued Performance Improvements

SS&C has a number of improvements planned to improve the performance of HiPortfolio processes. Some of these initiatives include:

- investigating how to make access of database records more efficient by allowing multiple records to be retrieved in a single request
- improving efficiencies of specific processes, such as costing updates.

SS&C Product Suite Integration



SS&C has a number of products which logically sit alongside HiPortfolio. We have classified the products into 3 distinct categories, namely:

- Additional Value Step Processes:
 - Execution & Order Management
 - Loan & Margin Management
 - Trade Confirmation & Settlement
 - Performance Measurement & Attribution
- Increased Operational Control:
 - Reconciliations
 - Exceptions Management

- Reporting & Data Management:
 - Client Reporting
 - Regulatory Reporting
 - Management Reporting

Phase 1: Analysis of Product SS&C Opportunity Capability

SS&C is undertaking the analysis of the SS&C product suite across the multiple functional areas defined above. This analysis will focus on assessment of adjacent solutions to compliment the HiPortfolio solution by delivering even more advanced capabilities than available in HiPortfolio alone.

At this stage the products SS&C will be focusing on are:

- **SS&C Pages and ePages**
 - Pages is a market-leading client communication system that delivers information into your clients' hands as: documents; presentations; interactive, user-customized websites; with mobile access on tablets and iPads.
 - ePages is a presentation platform and development toolkit that delivers information across the internet via web pages. It delivers live, drill-down access to information, as well as pre-created and on-demand PDF files. ePages is part of SS&C's Pages platform suite. The Pages product suite delivers best-of-breed enterprise reporting in almost any format: .PDF, .DOC, .PS, .PPT and .HTML. Depending on the delivery platform required, one or more 'presentation layers', or delivery platforms can be chosen.
- **SS&C Evare**
 - Evare provides a single connectivity point between clients and their counter-parties, subsidiaries and internal systems. Evare's core competencies revolve around financial data acquisition, enrichment, transformation and delivery. Service offerings include:
 - Clearance and Settlement, including SWIFT or direct receipt of trade and cash notifications from investment managers and delivery of settlement instruction to sub-custodians and other counter-parties
 - Reconciliation, including bi-directional communication of daily transactions, positions and cash balances
 - Corporate Actions, including distribution of instructions, communications and confirmations and collection of election notifications
- **SS&C Recon**
 - Recon streamlines IT, operations, and management procedures to allow for enterprise control of a client's organizational risk. It provides the tools to conduct auto exception routing, achieve ownership and assignment of breaks, control management escalation, and audit/report the entire cycle. It:
 - Streamlines the reconciliation of critical financial data for more informed decision making
 - Centralizes all reconciliations to standardize the business process and force consistency across accounts
 - Streamlines the delivery and presentation of information to management
 - Audits accountability and signoff within the application
 - Assigns breaks to appropriate employees for rapid resolution

- Provides sophisticated investigative tools to resolve issues
- Sends notifications to third parties for further investigation
- Updates automatically the SS&C system of record once issues are resolved
- **SS&C Go-check**
 - GoCheck is SS&C GlobeOp's web-based task management system. GoCheck allows clients to capture processes as tasks, assign responsibilities to staff and aid task coordination, report on activities and manage deadlines and monitor the progress of all activities and key controls, together with procedure documents and copies of key deliverables for daily, weekly and month-end activities.
- **SS&C Antares**
 - Antares is a comprehensive front-end trade order management system (TOMS) which enables firms to maximize their ability to trade multiple assets within one system to create a straight through process and seamless integration from front to back-end.

Phase 2: Understand Existing Implementations of SS&C Product Capability

SS&C will, following phase 1, look to leverage existing implementations of SS&C products integrating with HiPortfolio to establish best practice for integration. This phase will uncover not only implementation best practice, but also identify software development that will enable better integration between the various products.

To ensure an optimal integration strategy is achieved, SS&C will draw from the analysis perspective as well as the client experience.

Phase 3: Build Definition

SS&C will, in line with client demand, build capability to integrate with the SS&C product suite in the most effective manner.

Phase 4: Software Delivery

SS&C will undertake a program of work to optimise integration between HiPortfolio and SS&C products as defined above.

Extended CC-API coverage

SS&C continues to make additional HiPortfolio processes Control Console API aware, aligned to the overall integration strategy and supporting our clients in achieving more STP opportunities within their business processes.

In addition all CC-API aware functionality can be executed by the External Task Agent.

Platform and Deployment

JVM HiPortfolio

The Cobol Compiler Migration project will allow SS&C to explore options for releasing HiPortfolio within a Java Virtual Machine (JVM). Launching HiPortfolio within a JVM offers options to leverage industry standard tools and easily integrate with various technologies.

JVM is a common environment in most enterprise businesses and people with skill sets for managing and configuring JVM environments are usually easy to find.

Migration to a JVM will help give HiPortfolio a level of future-proofing.

Speed and Efficiency Improvements

To meet our clients' continually time-sensitive business processing requirements, SS&C constantly reviews opportunities for improvements to architecture and framework implementation.

Database Upgrade Performance Optimisation

Working with the database vendor (Faircom), SS&C has been able to significantly improve timings on FIX programs being executed.

SS&C also showed that working with the optimal number of parallel sessions made a significant difference. The optimal number varies dependent on a number of external factors (including hardware, database and versions).

SS&C continues to work with our partner vendor, and aims to deliver optimised performance during the course of 2015.

Database Backup and Disaster Recovery

SS&C is continuously assessing options to improve backup processes and procedures, as well as the technology to support this function, and enabling more efficient disaster recovery for our clients.

A Special Interest Group (SIG) was held with our largest Australian clients and will be progressed through 2015 with target user groups to assess options to service these challenges for our clients.

Program Isolation

When receiving software changes, SS&C clients' need to know what areas of HiPortfolio they need to test. To service this requirement, SS&C is exploring how to detail where changes to HiPortfolio are made, and what impact those changes have programmatically, through an impact analysis.

SS&C is also breaking down HiPortfolio programs into smaller components, thereby further isolating programs and their impact to wider areas within the application.

This will provide the ability to install patches to HiPortfolio with minimal impact to existing operations, in order to reduce the amount of retesting required during implementation.

Hosted Deployment

SS&C is exploring options that would allow HiPortfolio to be deployed on a hosted environment. This could help reduce the cost to clients of deployment by enabling them to use hosted services.

SS&C is already working with a large global client to implement a hosted solution. Learnings from this exercise are being used in parallel to develop a strategy so that this service can be offered to other clients, while leveraging the broader infrastructure available through SS&C.

Deployment Models

Traditional deployment models for Windows and UNIX have limitations around the hardware that can be used.

SS&C is investigating alternative deployment models to allow the most efficient use of hardware across both environments, with the ultimate objective of reducing our clients (and SS&C's) cost of ownership of HiPortfolio.

Linux

Continuing the strategy to lower the cost of ownership for HiPortfolio clients, SS&C is committed to the provision of further deployment options. Linux is seen by many SS&C clients as a way of leveraging more cost effective infrastructure to run their HiPortfolio ecosystem.

Architecture and Framework

Event Message Broker & Framework

Automation will allow for process efficiencies and improvements within the HiPortfolio ecosystem. The roadmap items in this section concentrate on flexibility that will help reduce total cost of ownership, while at the same time adding extra functionality. SS&C has delivered the infrastructure component and some basic events through HiPortfolio 14.0 and going forward events will be developed and deployed to facilitate easier integration between HiPortfolio and external (including the SS&C product suite) products.

Events

In the HiPortfolio environment an 'Event' is defined simply as 'something that has happened'. It could be that a process has started or that some issue has occurred.

A HiPortfolio event is a small message for notification to other components within the ecosystem. SS&C is exploring the technical framework needed to support event message capture and distribution. This capability will open many further use-case opportunities from Unit Pricing workflow management to a fully integrated Exceptions Management framework.

Business events

Business events concentrate on notifications that refer to a business process. It may be that a process has started late or is overdue. Using these events other components (like the proposed SS&C dashboards) can track the events to help monitor the flow of a business processes.

Technical events

Technical events are all events that are not business events. An example may be a warning status from the database or an indication that the amount of free disk space has reached a threshold. Technical events can also be published to dashboard components to help operations staff monitor the state of HiPortfolio.

Business Function Services & Web Services

The Business service item is intended to expose the existing business functionality in HiPortfolio across an industry standard interface. A business service is sent to HiPortfolio to request HiPortfolio perform some type of business function.

The business services in this item are intended to be loosely coupled service requests that help make them technology independent.



Speed and Efficiency Improvements

To meet our clients' continually time-sensitive business processing requirements, SS&C constantly reviews opportunities for improvements to architecture and framework implementation.

External Task Agent

The External Task Agent (ETA) extended the existing Slave API to allow any slave aware task to be triggered to run synchronously or asynchronously using a loosely coupled connection.

The ETA capability will be further extended to include richer functionality to expose more HiPortfolio business processes. In addition, a simple queuing capability will be introduced to allow easier integration and scheduling to external workflow systems.

Business Function Services & Web Services

Expanding on the External Task Agent (ETA), services will be designed to open further business operations to external control, both in the local environment and via web services.

Unlike the ETA these services are the individual business functions that make up a specific slave task. This will allow for a variety of opportunities to enable flexible integration into an enterprise environment.

Roadmap Forward Focus (version 16.0, 2016 and Beyond)

Investment Strategies

Multi-exchange Rate Coverage

Building on the Multi-pricing concept and capability within HiPortfolio, this project will explore options to support multiple foreign exchange rates from different sources for client reporting and accounting needs. The project would add a new module to allow users to define exchange rate sources at portfolio level.

Taxation

Support for Market Specific Tax Regime Changes

SS&C is committed to understanding and responding to market specific tax regime changes as proposals are issued and guidelines are agreed.

SS&C is an active member of the Australian Custodial Services Association (ACSA) Corporate Actions Working Group in Australia. Through SS&C participation at the ACSA working group, and the Business Advisory Board, SS&C were able to work with all Tier 1 Australian clients to undertake a project for the recent Franking Credits changes, as a result of the guidance paper from the Australian Tax Office (ATO). SS&C will continue to look for opportunities to work with the local client base where tax legislated changes are expected.

Market Regulatory

SS&C is committed to understanding and responding to regulatory change as proposals are issued and regulatory guidelines are agreed. Employing a dedicated team engaged with Global regulatory forums, SS&C is well placed to support client needs through regulatory change.

IFRS Phase 1

IFRS Phase 1 Classification and Measurement of Financial Assets

Under IFRS 9 the following two measurement categories for instruments are permitted:

- Fair Value
- Amortized Cost

Previously under IAS39 instruments there were four categories of measurement:

- Financial assets at FV through P&L
- Held to maturity (HTM)
- Available for sale (AFS)
- Loans and receivables

Enhancement is required to bring HiPortfolio into line with the new terminology and categorisation used in IFRS9 and to assist clients to move from compliance with IAS39 to compliance with IFRS9.

There are two further main phases of IFRS9 that will not be covered by this project:

- Phase 2 – Impairment
- Phase 3 – Hedge Accounting

Corporate Actions

Automation of Investment Accounting for Electives

Given the manual overhead and inherent risks associated with the management of electives, SS&C will explore options to introduce a level of automation to the investment accounting of electives.

SS&C is an active member of the Australian Custodial Services Association (ACSA) Corporate Actions Working Group in Australia and continues to monitor client challenges and regulatory driven changes for consideration.

Unit Pricing & Reconciliations

Workbench Overlay to Improve User Operational Experience

This project will explore options to leverage the SmartClient capability within HiPortfolio's Web UI allowing rich, flexible visuals and enhanced capabilities to compliment Unit Pricing and Reconciliation tools within HiPortfolio.

Unit Pricing Strategy

The Unit Pricing strategy contains candidates that are intended to enhance the overall efficiency of the unit pricing routines. The vision is to enhance the ability to calculate and manage the unit pricing process and covers a number of unit pricing processing stages

Exceptions Management

Building on exception visualisation through HiPortfolio's Web UI, this project will explore enhanced capabilities to not only view but also manage exceptions for key functional processes.

This project may include the ability to:

- take remedial actions to resolve exceptions
- maintain auditable information of exceptions and resolutions
- manage stale and unchanged prices.

Error Framework

SS&C is looking to extend the Error Framework to allow external systems to interact and interrogate HiPortfolio error and warning messages. This will enable easier integration to third party systems, for example, workflow where the system can determine the difference between a warning (which can be ignored), and an error (which must be actioned)

Delivered Roadmap Items in HiPortfolio/3 version 14.0

Category	Item	This enhancement will...
Investment Strategies: Fixed Income	Effective Yield	<p>Provide the ability to amortise debt instruments using the effective interest method.</p> <p>The effective interest rate (EIR) will be recalculated after new purchases and projected coupon or principal changes.</p> <p>This enhancement will also provide the ability to adjust the amortized cost independently of the yield to enable the reconciliation of both an amortized value and yield for a given position and date.</p>
	Autobatch improvements	<p>Provide the ability to run autobatch and create 'paydown' transactions for FI-19 and FI-20 securities only by adding a new field, <i>Principal repayments only</i>, to the Automatic Transaction Generation window.</p>
	Schedule Correction Audit	<p>Allow the Pool Factor Import and Standard Audit Report to export to an ASCII file.</p>
	Amortisation Collars	<p>Extend the HiPortfolio functionality for amortisation collars.</p> <p>Currently, amortisation collars can be used in HiPortfolio for portfolios that adhere to the US Generally Accepted Accounting Principles (GAAP).</p> <p>This enhancement will make it possible to apply collars to European and Asian portfolios using the International Financial Reporting Standards (IFRS) for fixed interest security subtypes 19, 20 and 22 (with sinking fund).</p> <p>This extended functionality, will be applied to:</p> <ul style="list-style-type: none"> both sub portfolio and propagated portfolio levels, in line with existing functionality. new sale transactions and existing sale transactions that have been deleted and re-entered after the implementation of this enhancement.
	Ex period in Business Days	<p>Provide the ability to derive and populate the ex-date of fixed interest coupons correctly when generating interest schedules and interest entitlement transactions. This can be done through manual entry or autobatch, using predefined rules around non-business days and coupon mode.</p> <p>To facilitate this enhancement a new field,</p>

Category	Item	This enhancement will...
		<i>Ex period mode</i> , will be added to the Calculations frame on the Main tab of the Security Maintenance window.
	Compliance Check by Clean Value for Fixed Interest	Provide the ability for the Compliance Exception report to value fixed interest instruments using either the market or the capital value.
	Interest Tables	<p>This project expands the interest rate table code from two characters to four in all instances in which it is used in HiPortfolio.</p> <p>In HiPortfolio, interest rate tables can be attached to either money market accounts or variable rate bonds.</p> <p>Currently, the HiPortfolio interest rate table code is only 2 alphanumeric characters. Therefore, only a maximum $62 \times 62 = 3,844$ (A-Z, a-z and 0 to 9) of tables can be created before the combination of codes are used up. It is very difficult to re-use the interest rate table codes as the life of the bond can be as long as 5 years.</p>
Investment Strategies : Swaps	Entry on one Leg of Swap	Introduce a new module, Swap Notional Adjustment (S1), that, when enabled, will provide the ability to cater for notional adjustments for Mark to Market cross currency swaps. It will do this by introducing a new adjustment subtype that allows you to define the amount by which to adjust the face value and cost for one leg of the swap.
	Processing Inflation Linked Swaps	<p>Provide the ability to set up and administer the following swap types in HiPortfolio:</p> <ul style="list-style-type: none"> Compounding Accruals Swaps Inflation Linked Swaps
	Swap Conversion Tool	Identify any changes required to the Bulk holding conversion (BCHLDUPD) utility and provides the ability to convert an FI-04 Australian indexed security to an FI-21 Swap security.
Market Regulatory	US Regulatory 2014	Ensure the quarterly and annual regulatory reports for all US accounts and year end reports for US entities meet the US Regulatory requirements as defined by NAIC.
Corporate Actions	Capital Events	<p>Build on existing corporate actions functionality:</p> <ul style="list-style-type: none"> provide core capability to interface capital events between XSP and HiPortfolio deliver a defined set of events as core capability

Category	Item	This enhancement will...
		<ul style="list-style-type: none"> provide end to end oversight of the process from an STP perspective
	HiPortfolio Asset Class to XSP Product Mapping	<p>Provide:</p> <ul style="list-style-type: none"> a new lookup table to map specific HiPortfolio security category subtype combinations to an XSP product type an update to the XSP security entity to deliver the mapped product type attribute within the XML message for XSP validations and associated logging of exceptions
	Advanced XSP Integration and Straight-through-processing	<ul style="list-style-type: none"> Enable HiPortfolio to consume collective investment scheme data from XSP, which is now able to source this data in global markets, through SWIFT messages. Provide the ability to determine, at any point in the day, the correct eligible positions. Enable the straight through processing of corporate actions announcements from XSP to HiPortfolio, resulting in: <ul style="list-style-type: none"> reduced costs through decreased manual intervention timelier processing of corporate actions less risk of incorrect corporate action information in HiPortfolio
	Closed Market Processing	<p>Provide the ability to run autobatch:</p> <ul style="list-style-type: none"> for a single security for an across fund portfolio for a defined group of securities, enabling for different regions to be processed separately
	Automated Income Announcements	<p>Automate the deletion and regeneration of transactions arising out of a change in a dividend announcement. This project introduces:</p> <ul style="list-style-type: none"> a new module to control deletion and recreation of existing transactions affected a new flag in fund maintenance to identify treatment of affected dividend transactions

Category	Item	This enhancement will...
		<ul style="list-style-type: none"> a new flag in user maintenance to control a user's ability to delete or update existing dividend schedules changes to dividend schedule maintenance to: <ul style="list-style-type: none"> support the new module's functionality viewing a history of all audit records for a dividend schedule entry changes to autobatch functionality to support the update of identified schedule records during processing changes to transaction processing to support: <ul style="list-style-type: none"> updating schedule record status distribution component update functionality for OS-03 and OS-09 securities updates to various reports, interfaces and DROs
Unit Pricing & Reconciliation	Exception Checking UPW	<p>Introduce the ability to track and report exceptions in the unit pricing process. It will include the ability to:</p> <ul style="list-style-type: none"> retrieve, display, filter, and report exceptions conduct a full audit trail of exceptions and track the history of each exception identify the exceptions that have a significant impact on the overall price movement report and export exceptions include portfolios across all funds in the Workbench and obtain a universal view of the status of the entire pricing operation.
	Unit Pricing Automation	<p>Provide the ability to import ASCII data into UPCSFIL at subportfolio level. The changes made in this enhancement also allow the running of sequential unit pricing programs in HiPortfolio to be fully automated without the need for manual intervention.</p>
Taxation	TOFA take-on function	<p>Allow the purchase transaction ID, created by the Bulk Security Conversion function, to be reported using the Tax Report Generator.</p>
	TOFA Units Reconciliation	<p>Allow the reporting of TOFA adjusted units (the latest face value after adjustments and principal payments as at the TOFA</p>

Category	Item	This enhancement will...
		generation or unwind date) in the Tax Report Generator.
	TOFA for Ex-interest Purposes	Change the TOFA data generation engine when processing parcels acquired on an ex-interest basis, and change the TOFA calculation engine when deriving the market value for ex-parcel basis.
	TOFA Units versus Tax Parcel	Change the TOFA Data Generation to match TOFA units with the corresponding tax parcels, instead of deriving units.
Operational Control & Automation	All funds no passwords	Provide the option to enforce password protection when running Report Generator (RG) reports across all funds. It will do this through the introduction of a new RG module parameter, Bypass fund passwords. This parameter will determine whether the RG report execution job processes all available funds without prompting for a password on password-protected funds.
	Multi-pricing	Provide the ability to define a system wide default pricing hierarchy that will control the price source for holding valuations.
	Post MtM Reset Transaction Journals	Provide the ability to: <ul style="list-style-type: none"> • Create book value adjustment records for disposal transactions when running incremental mark to market, tax/costing update or IBVSALE utility • Create GL journals for book value adjustment records made when an incremental MtM updates a book cost • Post book value adjustment records to the GL using standard GL integration or soft GL integration
	CN Clean Pricing	Provide the ability to value a convertible note correctly by using the clean price and then adding the accrued interest amount up to the valuation date.
	Costing Unwind Multiple Input	Provide the ability to unwind costing for multiple securities across multiple fund, security and portfolio combinations.
	GL Timestamps	Provide the ability to specify a start and end time when executing a General Ledger report.
	Journal Import Account Creation	Provide the ability to automatically create missing accounts in a GL filesset from the root account defined in the master filesset, when a batch of journals is imported using

Category	Item	This enhancement will...
		the Import batch journals function.
	API Tagged Parameters	Make several processes CC-API aware.
	Console Completed Jobs	Provide the ability to report console job start and end times with higher precision, allowing for more accurate job duration benchmarking.
	Pervasive Quiesce	Provide the ability to take a consistent logical backup of the HiPortfolio database without forcing all users to exit the system.
	Business Intelligence Framework Upgrade	<p>Provide additional functionality to the following areas through the introduction of upgraded components, bring HiPortfolio in line with current Anova capabilities:</p> <ul style="list-style-type: none"> • Tables and graphs • User designed visualisation components <ul style="list-style-type: none"> • Ability upload • Ability to add to customised dashboards
	External Task Agent	Provide the ability to run HiPortfolio API aware programs and RG reports externally from the HiPortfolio system.
	Events Infrastructure	Build the framework that will enable a message broker service, so that when an event happens in HiPortfolio a message can be sent. Messages can vary in type from Email, RSS feeds, SMS messages and operation dashboards.
Platform & Deployment Initiatives	Certifications	<p>Certify:</p> <ul style="list-style-type: none"> • Windows 8 • C-tree 10