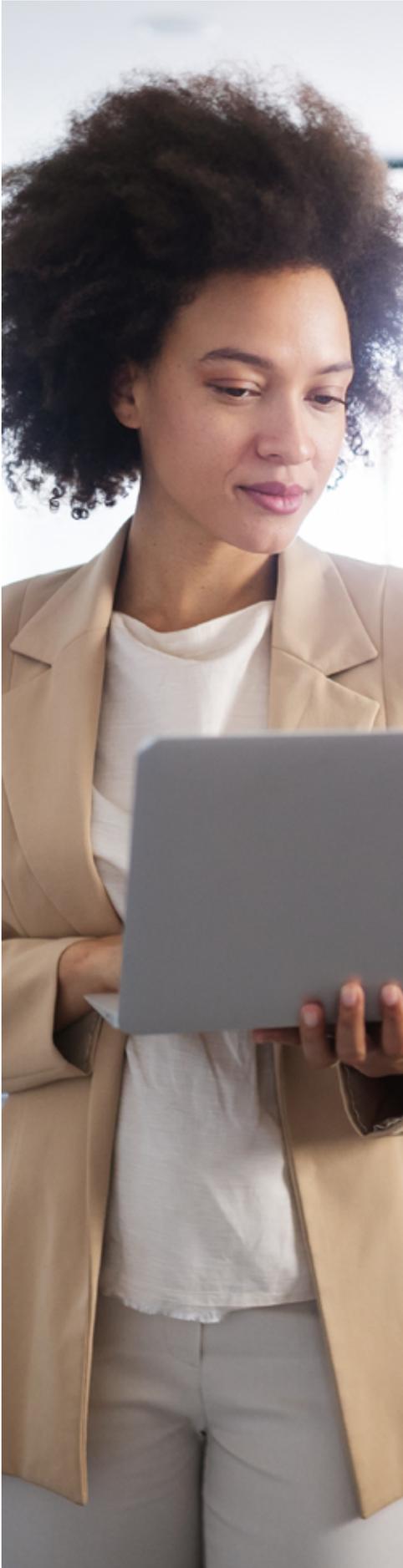




Customized Automated Reconciliation Jobs in ServiceNow





Introduction: Software Licenses and Software Audits

In today's tool driven work environment, software is essential for driving productivity. While there are numerous freeware and shareware options available, most software utilized on an enterprise level is purchased or leased through software licenses. As an enterprise, it is important to develop a solid Software Asset Management process to maintain compliance, optimize spend, and support audits throughout the software lifecycle. Of the three areas mentioned, audit support is often the greatest concern.



Types of Software Audits

There are **two types of software audits: Internal and External.**

External Audits are done by the **software vendor** to assess the adherence of an enterprise to the software licensing agreement they are bound to. It is often the case that software vendors often take license holders by surprise with drive-by audits. According to **Gartner** (2016) **at least 68%** of enterprise received at least one audit request per year, with requests typically coming from the major providers such as Microsoft, Oracle, Adobe, etc. Enterprises not in compliance often must pay “**True-up**” costs and penalty fees. A survey of software trends from 2013-2014 by **Flexera** had found that **85%** of companies were not in compliance, **56%** had to pay true-up costs; with **21%** of companies surveyed owed true-up costs of more than **\$1 Million**.

On the other hand, **internal audits** are done within the organization as a part of the **software license management process**. Internal audits allow organizations to gauge compliance in a comparatively non-pressure environment. By having consistent visibility of software usage, an organization can optimize their spend and deployment, but be prepared for when external audits occur.





Software reconciliation

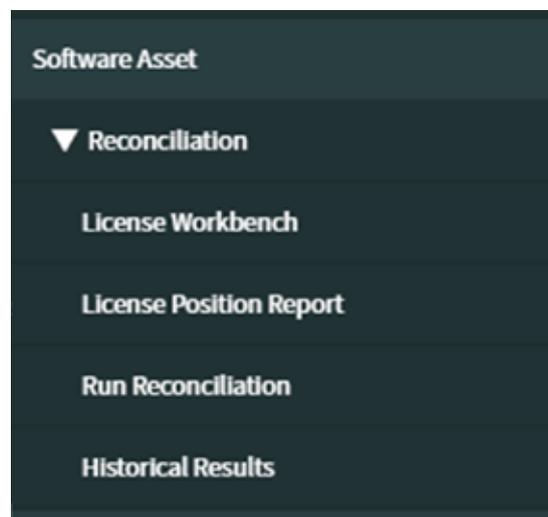
The most essential component of Internal Auditing is Software Reconciliation. Software reconciliation is the process of calculating your software compliance using the following equation for a given Software:



Number of Software Rights Available from a Purchased Entitlement - Number of rights consumed through installation or Subscription Usage



While the high-level equation seems simple, calculating this manually can be a painstaking process depending on the diversity of application licenses that are maintained, how the licenses are recorded, and how record keeping for installations and allocations are handled. Conveniently, ServiceNow provides tools to automate this process, as well as provides a system for centralizing this data via the **Software Asset Management Professional** (SAM Pro) application.

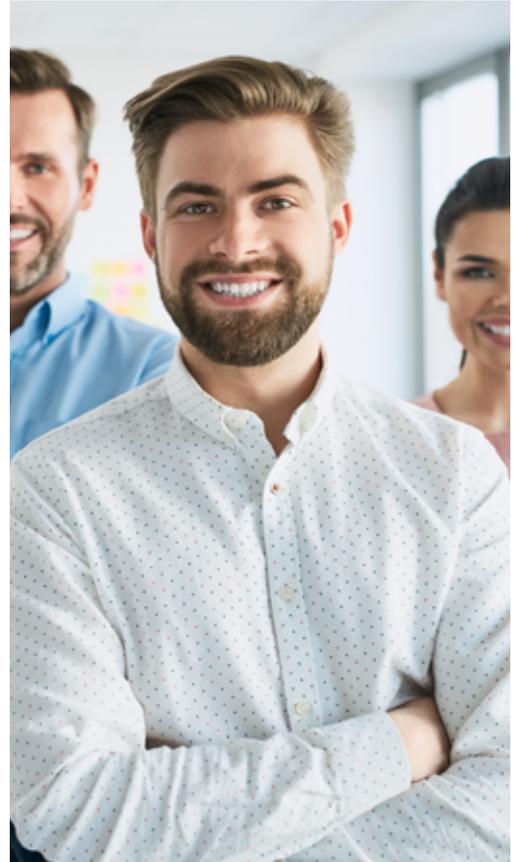


Software Asset Management Application's Reconciliation Modules



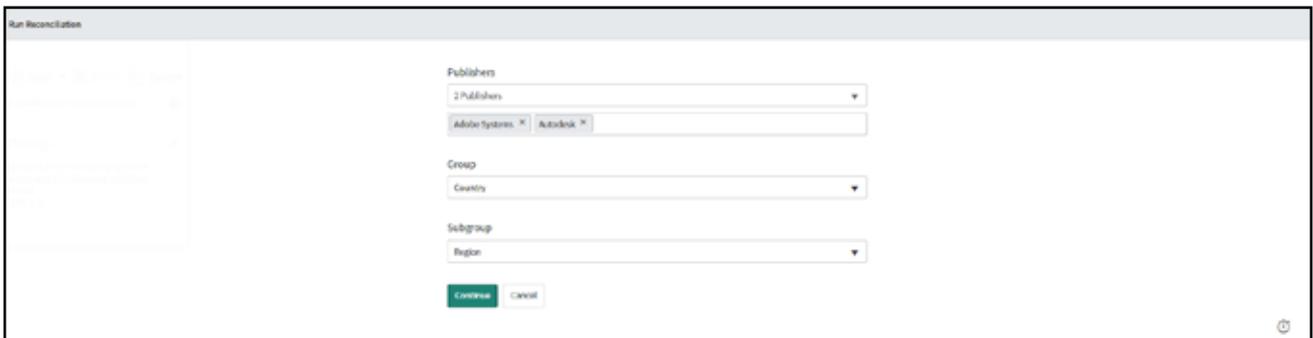
A note about trustworthy Data and Reconciliation

It is important to note that ServiceNow's Reconciliation only calculates software license compliance. To make these calculations it relies on records import and maintained by Software Asset Managers, Contract Managers, Service Desk and other stakeholders. Trustworthy Data is the cornerstone of accurate Reconciliation results. Before running reconciliation, it is important that all data required has been imported and normalized into the system. A ServiceNow Implementation Specialist can best assist you with the consolidation and sanitation of data.



Running and viewing Reconciliation in ServiceNow

In ServiceNow's SAM Pro application, users can run reconciliation on-demand at the push of a button. The application automates reconciliation calculation and provides several flexible options for grouping data. For example, Reconciliation can run for all or 'one or more' publisher(s). Reconciliation can be further grouped and sub-grouped by country, region, cost center, department, or company.



Run Reconciliation Screen with Publishers and Grouping



Reconciliation results can be viewed in several presentation options such as Historical Results records and the License Position Reports list. The most widely utilized and functional option is the License workbench, which provides actionable remediation.

In the workbench, Reconciliation results (i.e. Compliant or Not Compliant) are displayed in the following tiers: Vendor, Product, and Software Model. In all tiers, additional calculation results are displayed for True-up (remediation) Costs, Over-Licensed (licenses not in use) costs, and Potential savings (savings of compliance with optimal usage).

The screenshot shows the 'License Workbench' interface. At the top, there is a search bar labeled 'Filter publishers'. Below it, there are three tabs: 'All Publishers (51)', 'Publishers Out of Compliance (45)', and 'Pinned Publishers (12)'. The 'All Publishers (51)' tab is selected. A 'Sort by: A-Z' dropdown menu is visible. The main content area displays a grid of publisher cards. Each card shows the publisher's name, a compliance status (Not Compliant or Compliant), and three financial metrics: True-up Cost, Over-licensed Amount, and Potential Savings.

Publisher	Compliance Status	True-up Cost	Over-licensed Amount	Potential Savings
Absolute Software	Not Compliant	\$0.00	\$16,804.40	\$0.00
ACL Services	Not Compliant	\$0.00	\$0.00	\$0.00
Acuant, Inc.	Not Compliant	\$0.00	\$0.00	\$0.00
Adobe Systems	Not Compliant	\$0.00	\$30,415.26	\$0.00
Aellius	Compliant	\$0.00	\$0.00	\$0.00
Ambir Technology, Inc.	Not Compliant	\$0.00	\$0.00	\$0.00
Apple	Not Compliant	\$0.00	\$0.00	\$0.00
Argus Software	Compliant	\$0.00	\$12,534.78	\$0.00
Autodesk	Not Compliant	\$0.00	\$0.00	\$0.00

Vendor level reconciliation results



The Software Model level provides additional results and functionalities. For example, results for software metrics for a given software can also be viewed. For software in which multiple entitlements are purchased using multiple metrics (e.g., some 'Per User' and some 'Per Device'), the compliance results will be displayed for each metric. Additionally, users can view a list of unlicensed and unallocated installations based on their data acquired from discovery tools like ServiceNow Discovery & SCCM, and imported entitlement data. Users can also view Removal candidates which are created based on usage and licensing/allocation information.

While visibility and already being compliant is important, one of the greatest value-addition of the work bench comes to light when reconciliation has returned a result of non-compliance. In the case of non-compliance, Remediation options will also be displayed. Depending on the level of integration with other applications such as procurement, orchestration, and REST APIs for SaaS admin accounts, Users will have the capability to remediate their non-compliance directly from the workbench, although this is a whole other topic in itself.



The screenshot displays the Microsoft License Workbench interface. On the left is a navigation pane with a search bar and a list of products including Outlook, Excel, Office 365, OneNote, Outlook, Phone System, Power BI, PowerPoint, Project Online, Skype for Business, and SQL Server. The main area is titled "Visio Any Version and/or Edition" and shows a summary table with the following data:

Total Spend	True-up Cost	Over-licensed Amount	Agreement Type
\$0.00	\$0.00	\$0.00	Generic

Below the summary table, there are tabs for "License Metric Results", "Remediation Options", "Unlicensed Installs (226)", "Unlicensed Subscriptions", and "Removal Candidates (1)". The "Unlicensed Installs (226)" tab is selected, showing a table of software installations:

Display name	Publisher	Version	Installed on	Assigned to
Microsoft Visio - en-us	Microsoft	16.0.13426.20308	L490-000720	Jerry Taylor
Microsoft Visio - en-us	Microsoft	16.0.13426.20308	L14-001354	(empty)
Microsoft Visio - en-us	Microsoft	16.0.13426.20308	L490-001179	Susan Thomas
Microsoft Visio - en-us	Microsoft	16.0.13328.20356	L490-001145	Richard Myrick

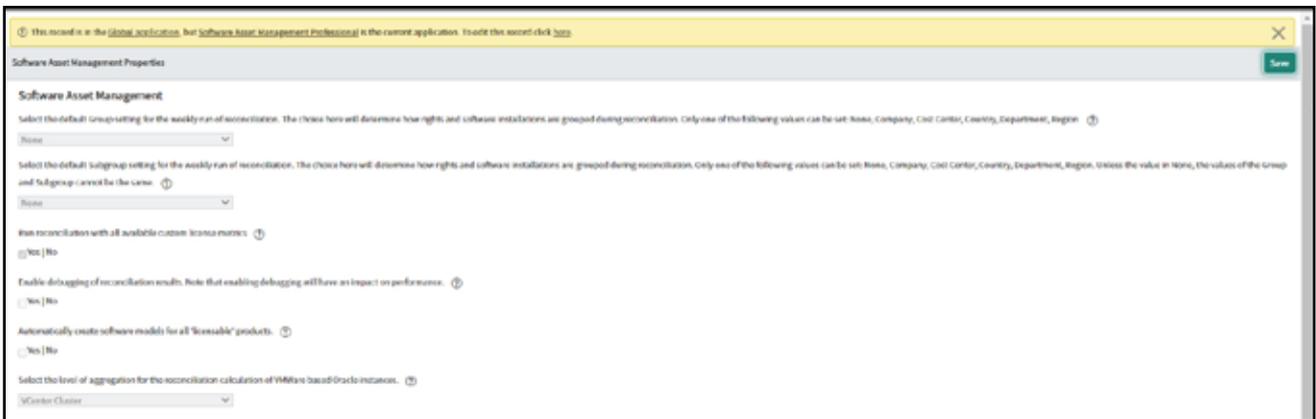
Software Model level results



Use Case: Customized Automatic Reconciliations

About Automated Reconciliation

Aside from running reconciliation on-demand, automatic reconciliation via a scheduled job is also available. By default, this is run once per week for all publishers and users can configure grouping for the automatic reconciliation via system properties.



Software Asset Management Application Properties





Automated reconciliation for Software Subsets

Automated reconciliation is run for all publishers out of the box and there is no configuration option to apply this to a smaller subset. However, occasionally we will run into clients who would like to add additional automated reconciliation for a single publisher or set of publishers.

For the most part, the default weekly reconciliation for all publishers is sufficient. Additionally, running reconciliation is not overly taxing on instance performance so why might one decide to have additional Jobs for subsets? First, some enterprise software environments are vast enough that reconciliation will take a long time. Breaking it up into subsets can help offset this. Second, some organizations utilize software from vendors overwhelmingly more often than others, and in the interest of preparing for surprise audit requests would like to monitor certain software vendors more often. The last is they would like to run automated software reconciliation with a variety of different groupings.

Unfortunately, this is not available out of the box. On the bright side, ServiceNow's platform provides the infrastructure to make this possible with a little customization. Let's take a look at how we were able to implement this for one of our clients so you can implement your own.

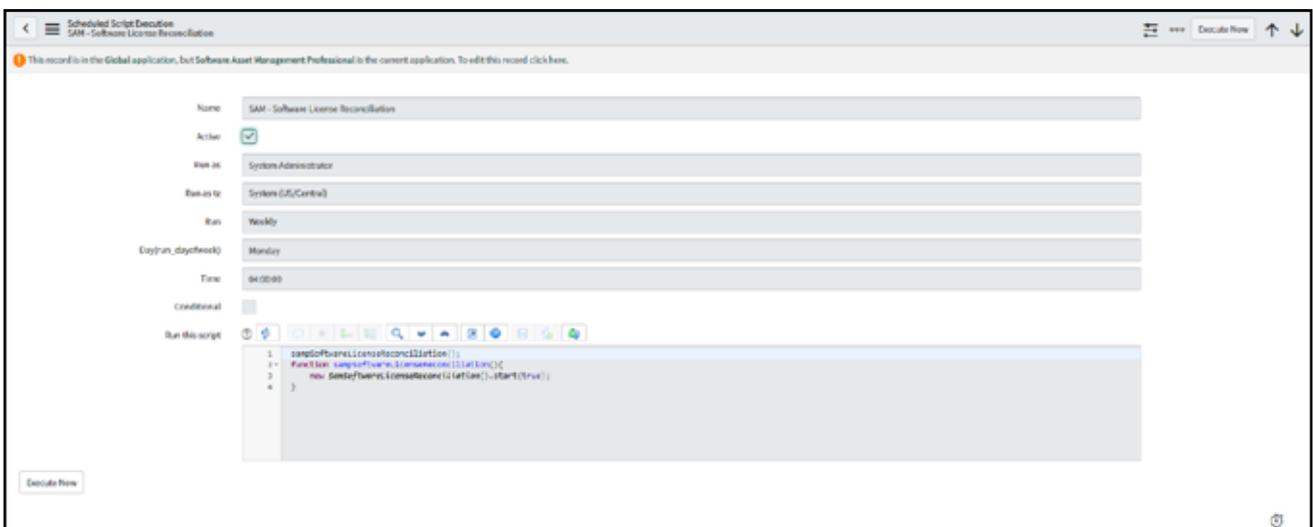




Implementing your own Scheduled Job

The Out-of-box Jobs and Script

When creating a custom job, the first thing is to look at the existing job. Below is a screenshot of the out-of-box job, 'SAM – Software License Reconciliation'.



Automated Weekly Reconciliation Scheduled Job in its Out-of-box form

The job itself does not tell us much here other than that it uses 'util' function from the 'SamSoftwareLicenseReconciliation' Script Include. In most cases, simply checking the Script Include itself is enough to point one in the right direction. Unfortunately, the Script Include in question is 'protected' and does not expose us to the 'under the hood' implementation



The all-knowing yet very secretive Script Include

Luckily, there is another place where reconciliation is run that we've seen before in this post. That's right: The Run Reconciliation Page!



A Look at the 'Run Reconciliation' Page

A quick look at the UI Page record for the run reconciliation record tells us much more than we bargained for. While the HTML structure and client scripts are an interesting read, our specific target is the data 'Processing Script', which handles the data once it reaches the server.

A quick search with 'ctrl-f' in that script quickly confirms that the same Util used in the Scheduled job is also used here (see Line 27); the very same. What is surprising here is the major difference... Parameters can be passed into this one! This makes sense since the page provides dropdown boxes for grouping and vendor selection.

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Processing Script for the 'Run Reconciliation' Page

Looking at the lines for Parameter Assignment we can see the following:

1. The publisher parameter is an array of sys_id's of company records from the 'core_company' table
2. The group and subgroup parameter are strings; a quick look at the 'html' code shows that the value for this is drawn from the 'code' field in the 'Reconciliation Groups'('samp_groups') table. See below for image
3. There is a third parameter for 'domain' if you are utilizing domain separation

The rest runs the script string as if one was running a scheduled job with the 'Execute Now' button on the Job Record. This is done using the same job name to provide some consistency in the 'Scheduled job logs'.



Name	Table	Code	Display column	Group column
Company	cmr_company	company	name	
Cost Center	cmr_cost_center	cost_center	name	
Country	cmr_location	country	country	country
Department	cmr_department	department	name	
None		none		
Region	cmr_location	region	name	

Grouping options for reconciliation in the 'Reconciliation groups' table

Implementing the Custom Job

Based on our findings in the UI page, we can pass a JSON object as a parameter into the execution script string, and then execute the job and script similarly to what is done on the UI page. The major difference here is that unlike the UI page, which has selection options via dropdown for at-the-moment selection, we know exactly what grouping we want already and can hardcode it in for each job we create. When we put it together we get something like below.

```
1 samsoft@ml:~/software/licenses$ cat /dev/null > /dev/null
2
3 // reconciliation function
4
5 function samsoft@ml:~/software/licenses$ reconciliation() {
6   // JSON formatted parameter string
7   var params = '{"publisher":"00000000000000000000000000000000","group":"None","subgroup":"None"}';
8
9   // Run script with Parameters
10  var jobname = 'sam - Software License Reconciliation'; // need job
11  var script = 'sam SAMSOFT@ML:~/software/licenses$ reconciliation -p "' + params + '"'; // script string with params
12  var AssetManagement@ml:~/software/licenses$ cat /dev/null, /dev/null, ReconciliationCompliance.RECON_JOB_010_010;
13
14
15 }
```

The end results

The end result is brief and effective. This script can be then configured for whatever interval you desire. It can also be re-used with only minor changes to the JSON object string depending on the vendor and grouping.



Final thoughts

Overall, following a solid Software Asset Management process with regular reconciliation will ensure continued compliance with your vendors, aid in optimizing usage, and help save and mitigate potential risk of paying staggering true-up costs. With some simple customizations to the scheduled job, you can fine tune and add additional jobs to optimize the performance and visibility of your internal audits.



About Aspire



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