

- *“Climbing the Mountain of Software Licensing”*
K2 - KeyAuditor & KeyServer Configuration Training
Software/Hardware Management Best Practices with K2

- **Sassafras Software Inc.**

Sassafras Software is an early pioneer in the development of software license compliance and software asset management (SAM) technology for desktop computers. For over 20 years Sassafras technology has been a critical part of license compliance and software cost reduction efforts in some of the largest corporate, educational and government enterprise networks worldwide. Sassafras enjoys broad support from software publishers, including many technical partners that rely exclusively on K2-KeyServer technology.

Sassafras has been instrumental in driving the development of software licensing standards for two decades. Members of the Sassafras team were among the coauthors of the LS-API specification in the early 1990's. In recent years, Sassafras has sponsored a company staff member to serve as a coauthor for the ISO/IEC 19770-2 international SAM Standard for software identification and as the Convener of the working group developing the ISO/IEC 19770-3 SAM Standard for software entitlements.

Sassafras Software has been recognized by the world's leading IT Asset Management associations with the highest levels of professional recognition in the IT Asset Management industry.

- **John Tomeny, VP, Business Development**

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IAITAM Fellow

2007 SAM Practitioner of the Year

itSMF Delegate to ISO/IEC WG21 for Software Asset Management

Convener, ISO/IEC 19770-3 OWG - Software Entitlements Tag standard

- **College of the Holy Cross**

Worcester, MA

1 December 2009

Hosted by: NERCOMP

“Climbing the Mountain of Software Licensing”: K2 - KeyAuditor & KeyServer Configuration

- **John Tomeny, IAITAM Fellow**

About the Presenter:

Mr. Tomeny is a seventeen-year veteran of the Software Asset Management (SAM) and IT Asset Management (ITAM) industries. He is Convener of the ISO/IEC 19770-3 working group on Software License Entitlement, a distinguished recipient of the IAITAM Fellow designation from the International Association of IT Asset Managers (IAITAM), a recipient of the 2007 SAM Practitioner of the Year award, a member of the Software & Information Industry Association’s (SIIA) Finance & Operations Executive Council, and the IT Service Management Forum (itSMF).

John serves as chief IT Asset Management (ITAM) consultant and trainer to Sassafras’s North American and European customers. In this capacity, John provides one-on-one training services for hundreds of SAM practitioners. He is a contributing author for SAM and software licensing topics to ITAK Magazine published by the International Association of IT Asset Managers (IAITAM). He is a co-author of the ISO/IEC 19770-2 Software Identification Tag standard and the ISO/IEC 19770-3 Software Entitlement Tag standard.

John has consulted numerous times over the years with Adobe Systems on licensing concerns. In the 1990’s, John coauthored the concurrent-use licensing language first used by Adobe Systems for its “Open Options” volume licensing programs. He was a contributing author to the SIIA’s former “Self Audit Guide” used by corporate and educational organizations worldwide to achieve software license compliance.

As a leader in software license entitlement technology, Mr. Tomeny is active in many industry forums that promote the dialog between SAM administrators, compliance officers, software publishers, licensing service providers, and industry associations. He has presented software licensing issues by invitation for discussion at many industry and educational forums including the ISO/IEC SAM Standards Working Groups, Gartner Group’s Software Asset Management Special Interest Group (SWAMI), the International Association of IT Asset Managers (IAITAM), the Software & Information Industry Association (SIIA), the US National School Board’s Association (NSBA), Macworld IT Management Conference, the Japan Personal-Computer Software Association (JPSA), the Japanese Ministry of International Trade and Industry (MITI), Goldsmiths - University of London, the Academic Applications Forum - United Kingdom (AAF), The EDUCAUSE Software Licensing Issues Constituent Group, the US Department of Defense (DOD) Software Product Manager’s Team, the DOD IT Asset Management Integrated Product Team, the IBSMA, and other forums.

- **K2 - KeyAuditor & KeyServer Configuration Training**

- **Session Overview**

Today’s agenda is divided roughly into four parts of educational content. Timing marks for each of these parts are approximate with the exception of start time, refreshment break, lunch, and end time, which we will maintain to the best of our ability.

Sassafras Software has been developing and publishing KeyServer since 1989. The software, now named “K2 - KeyAuditor & KeyServer” is installed in some of the largest corporate, educational, and government networks throughout the world. Today I will provide a summary of how K2 has evolved over the years to what it has become today. And I will offer a detailed look at current common configuration and management practices with K2.

Today’s talks begin with a presentation of Sassafras’ vision for Entitlement-centric Software Asset Management (SAM). The most common software licensing models in use today were devised in the 1980’s and early 1990’s. They were designed at a time when personal computing was pre-enterprise, pre-mobile, and pre-virtual. These licensing models were developed with the primary goal of intellectual property protection and were unconcerned with effective management of software assets and license compliance. In short, they are not well suited to fulfilling the typical requirements and goals of Software Asset Management (SAM) Practitioners today.

Sassafras has a vision for how software licensing can rise to meet today’s customer requirements. To that end, we are enthusiastic participants in the active standards development work of ISO/IEC 19770-2 and 19770-3 which promises to facilitate an evolution toward entitlement centric software licensing. We encourage all SAM professionals to consider the ideas presented in our white paper on Asset-centric vs. Entitlement-centric Software Asset Management. Share it with other IT professionals and software publishers, and use the ideas presented in your own evangelism efforts to bring greater maturity to the licensing practices of software publishers.

In the interest of continuous development of these ideas, and the ongoing maturation of software licensing practices, we welcome your feedback on our thoughts.

- **Schedule - 9:00am - 3:00pm**

- 9:00am - 10:15am - K2 - KeyServer Overview
- 10:15am - 10:30am - Refreshment Break
- 10:30am - 11:45pm - K2 Configuration
- 11:45am - 12:45pm - Lunch
- 12:45pm - 2:15pm - Special Workflows and Processes, K2 Web Reports, Integration with External Systems
- 2:15pm - 3:00pm - Tips & Tricks, Common Technical Topics, and Q&A

“Climbing the Mountain of Software Licensing”: K2 - KeyAuditor & KeyServer Configuration

- Leased Licenses - what is their purpose?

Entitlement Centric Software Asset Management

In 1990 Claris Corporation introduced Concurrent use licensing to desktop computing, but not before they found a license management tool (KeyServer) that could correctly track and enforce the license model. With the release of K2 v6.2, Sassafra Software is again providing the tools and opportunity for software buyers and publishers to create a new licensing metric - Leased licenses.

The three most common software license models in academic computing today are Site licensing (often computed from FTE values), Per-device (node locked) licensing, and Concurrent use licensing. Any of these conventional models will work well in a desktop-only environment. Node-locked licenses, however, don't work well for virtual computers which are designed to appear frequently across numerous physical computers, and may disappear never to be seen again. Concurrent-use licenses can not be correctly managed on mobile computers that are often away from the network. And site licenses are often difficult to negotiate due to poor information on user demand and hence value.

But consider for a moment a license that is defined essentially as a blend of traditional node-locked licensing and concurrent-use licensing, where the entitlement has a specified “time-to-live” along with an automatic renewal policy. For sake of discussion let's call this a TTL license. Think of TTL licenses being managed by a license server in much the same way that IP addresses are managed by a DHCP server.

When a computer connects to the network, the DHCP server assigns or “leases out” an IP address with a specified lease renewal time (a.k.a. time-to-live). Assuming the time-to-live is one week, the computer will retain the assigned IP address so long as it uses the address at least once a week. But if the computer goes away from the network for longer than the lease period (one week) it may lose its address to another computer.

Under TTL (Lease) licensing, instead of allocating or renewing an IP address upon connection to the network, a software license is allocated or renewed upon execution of the software. Now suppose the time-to-live for this license is set for one month. It becomes easy to see how management of licensing under such a model could work exceptionally well to support desktop, virtual, and mobile computers in IT environments that are continuously replacing and upgrading computers.

Almost no effort needs to be devoted to license management in this scenario since the central license manager does the work automatically. A user launches a program and is granted a license. If the user continues to launch and use the software month after month the license is locked to that computer. But when the computer is retired, or if it is reassigned to another person who does not need that software, the TTL (Lease) license expires automatically, and in time, returns to the central pool to be used by another.

As we explore this idea of DHCP-style Lease licensing, we can see how a software publisher could adjust the TTL (Lease) timer to create a Concurrent use or node-locked license. A TTL (Lease) period that is set to one second equals CUL, while a TTL period set to five years produces a node-locked license. Thus, any licensing entitlement on this continuum can be managed by the same central license server.

But a more useful way to apply a TTL Lease license in an academic computing setting would be to set the lease timer for a period of one to two weeks. By using this model, any single computer that accesses the licensed software at least once during the lease period creates the effect of a node locked license. But computers that use certain software rarely will create an effect similar to concurrent use licensing. And computers that disappear (as in the case of virtual computers) and don't return, give their licenses back to the central pool so they can be made available to the next computer in line.

With K2 v6.2, Sassafra provides the tools. It is the job of software asset managers and buyers to experiment and negotiate effective Leased license models with publishers. We are available to exchange ideas and offer advice.

Portions of this article were first published in IAITAM's ITAK Magazine in October 2008. <http://www.iaitam.org/ITAK.htm>

“Climbing the Mountain of Software Licensing”: K2 - KeyAuditor & KeyServer Configuration

- **K2 - KeyAuditor & KeyServer**

An Historical Perspective

- Through the 1990's
 - **Elegant Solution for Managing Concurrent-use Licensing**
 - Adobe, Macromedia, EndNote, AutoCAD, and other products
- Today
 - **K2: an Integrated IT Asset Management (SAM) Suite**
 - Automated Software Asset Management and Hardware Asset Management
Enables IT Managers to efficiently...
 - Audit, Track, and Control all Licensing for
 - Software Assets, and
 - Computer Hardware Assets
 - Manages all common desktop software licensing models

- **IT Service Management vs. IT Asset Management**

- **What's the difference?**

There are a few thorough collective bodies of work that have been written on IT Service Management (ITSM) and IT Asset Management (ITAM). These two closely related disciplines cross paths with each other at many intersections, and thus, sometimes contribute to confusion when distinguishing their differences. A simple way to view their differences is to observe the difference in the focus of each of their titles.

- IT Service Management is the discipline of delivering information technology services to users to support their activities.
- IT Asset Management is the discipline of caring for, and maximizing the value of IT systems.

If those IT systems are software, we refer to the discipline as “Software Asset Management”. The ISO/IEC 19770-1 International Standard for Software Asset Management Processes tells us (in so many words) that the goals of SAM include reducing information technology (IT) costs and limiting business and legal risks related to the ownership and use of software, while maximizing IT responsiveness and end-user productivity to help an organization gain competitive advantage. (See: http://en.wikipedia.org/wiki/ISO_19770).

- **How can that difference impact your organization?**

K2 - KeyAuditor & KeyServer is used by thousands of customers worldwide to support both the disciplines of IT Service Management and IT Asset Management / Software Asset Management. On the one hand, K2 administrators are providing software to their end users, while on the other hand they are managing their software assets to both stay in compliance with software license agreements and to reduce their software/hardware costs.

The material offered in this training workshop will continuously cross the boundaries of service management and asset management. While some K2 administrators focus their work with K2 on service management, others engage in the broader range of asset management tasks with K2 to substantially increase the cost reduction benefits of K2-KeyServer. Sassafras recommends considering both types of IT management activities to receive the best possible value from K2.

- **References: The Industry Standards for IT Service Management**

- **The Information Technology Infrastructure Library (ITIL)**
http://en.wikipedia.org/wiki/Information_Technology_Infrastructure_Library
- **IAITAM Best Practice Library - IBPL**
<http://www.iaitam.org/IBPL.htm>
- **ISO/IEC 19770-1 International Standard for Software Asset Management Processes**
http://en.wikipedia.org/wiki/ISO_19770

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- **K2 - KeyServer Administrative Console Overview**
Managing Three IT Assets - Computers, Software, and Entitlements

- **Administrative console design and function**

Since KeyConfigure is designed to operate on both the Windows and Macintosh OS, some characteristics that are typically associated with one or the other of these operating systems are available on both systems.

- **Right Click for Commands, built-in Reports, and Contextual sensitive Help**

Right-click in any window or dialog to bring up its context menu. The context menu will contain a link to the specific help document related to that window or dialogue. Any specific commands or reports that are associated with that window will also be available for selection in the context menu.

- **Drag-drop functionality is common throughout the Admin Console**

Many commands can be carried out simply by dragging one object to another. Occasionally it does not matter which object is dragged to the other to establish a relationship between them.

- **Reports are fully integrated as clickable objects in KeyConfigure’s management console**

Each item in each report run from KeyConfigure’s console is a clickable object. When running reports, if you encounter an item that needs to have its configuration settings adjusted, you may simply double-click that item in the report window and edit its settings.

- **Computers Window**

<http://www.sassafras.com/hrl/6.2/computers.html>

The computers window can display every computer which has connected to the KeyServer. Computers are an important asset to track for obvious reasons. They allow us to know not only how many copies of a program are installed throughout the enterprise, but also where they are installed. Likewise, they allow us to define software licensing policies based on per-device (“node-locked”) and site licensing.

- **Right Side**

The main part of the Computers window is the right hand side. It contains a list of the currently filtered subset of all computers known to the KeyServer.

- **Left Side**

The left side of the Computers window allows the computers which are displayed in the right side to be filtered. The display of Computers can be filtered - either by Login settings, Divisions, or Filters. These tools are useful anytime an administrator needs to focus on a subset of computers.

- **Login Type and Division can be assigned to newly discovered computers**

When a new computer is discovered, it can be checked against a series of filters to determine what login type and what Division settings should be assigned. This automated process saves the K2 administrator from handling every single computer record. The filters are tested in order, and the actions associated with the first matching filter are applied.

If a rule sets a Division but not an Login type, the Login type will become set to the type associated with the default, Discovered rule. Computer that are auto-set by filters remain unacknowledged, as indicated by a pink “filter” icon in the Division column. If the filter rules are changed, they can be reapplied to all such unacknowledged computers, in order to easily recategorize them. If an admin manually sets a login type or a division on a computer, the computer becomes acknowledged, and henceforth will not be recategorized by filter rules.

- **Corresponding settings from 6.0 to 6.1 to 6.2**

<http://www.sassafras.com/hrl/6.2/new61to62.html>

6.0 Settings	6.1 Settings	6.2 Settings
Allowed, Audit	Full	Dedicated, Audit
Allowed, Don’t Audit	Basic	Dedicated, Don’t Audit
no equivalent	no equivalent	Leased
no equivalent	no equivalent	Dormant
Prohibited	Prohibited	Excluded

- **Computer Details Window**

http://www.sassafras.com/hrl/6.2/comp_details.html

The computer details window displays everything that is known about a particular computer. By customizing columns in the Computers window (right click in its window header area), you can display most of the information from the Detail window’s Information and Audit panes in tabular form in the Computers window itself. See the Computers Window Documentation for more general information about computers.

KeyAccess version 6.2 gathers many more hardware properties than earlier versions of KeyAccess. KeyAccess 6.2 also will audit Serial Numbers for some programs, and it has new functionality on Windows for auditing hotfixes.

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Popup view of installed software list

New areas that we will cover later: Expanded hardware properties, Hotfixes, Embedded Asset Tag data.

- **Programs Window**

<http://www.sassafras.com/hrl/6.2/programs.html>

The Programs window lists all of the programs known to your KeyServer. This list is the starting point from which you configure management of the software installed on client computers. The list of programs forms the basis for all license control, usage monitoring, and audit reporting. Programs are automatically added to this list as the KeyAccess client monitors software usage and performs audits. You can categorize programs into folders and use filters to focus your attention on the set of programs that you are interested in managing.

- **Right Side / Left Side**

As with the Computers Window, there is a right side and left side of the Programs window, each of which behave in similar ways to the right and left sides of the Computers Window.

The left side of the Programs window contains tools that determine which Programs are displayed in the right side. The display of Programs can be filtered - either by Actions settings, Folders, or Filters. These tools are useful anytime an administrator needs to focus on a subset of programs.

- **Program Families, Variants, & Versions**

KeyServer collects information about each distinct version of a program. For simplicity in managing programs, the items you see listed in the programs window are “Program Variants”, which group together multiple specific versions of a program, and allow you to ignore the uninteresting detail of which precise version is installed or used. All versions of a program are part of the same “Program Family”, even if they have been divided into multiple variants. By default, all major and minor release versions of each program are part of a single variant, but this can be configured in the program details window, e.g. so that each major version of a program is a separate variant.

- **Program Actions**

Every program listed in the Programs window is either Controlled, Logged, Audited, or Ignored. The action which is configured for any particular program determines what KeyAccess will do when a user attempts to use the program.

- **Controlled**

(blue box icon) - Programs which are set to Controlled can only be run if a License permits it. In addition, the usage of Controlled programs (and the Licenses which enable them) is always recorded in the Usage database. Finally, Controlled programs are always shown in standard audit reports. If the blue icon for a controlled program has a slash through it, then even though it is marked as controlled, there is currently no license controlling it - anyone attempting to run the program will be denied!

- **Logged**

(yellow triangle icon) - Programs which are set to Logged will have usage information recorded (like controlled programs), but usage cannot be controlled. That is, the launch of Logged program will never be denied. Logged programs are always shown in standard audit reports. Setting a program to Logged is similar to controlling it with a Site License, but there are a few differences.

- Logged programs can always be run and will continue to run until they are quit.

- A program controlled by a Site License can be configured such that it is not allowed to be launched offline. This would mean that even though there are unlimited licenses available, the program could not be run when the server can't be reached.

- A Site License can be configured such that it is not Detachable, which would mean that if a user launched the program, then became disconnected from the KeyServer, they would have to quit the program.

- A Site License can be restricted by a Group requirement. E.g. the group might be defined by network Location specifying the IP range of the “site”.

- If a logged program is launched and then the client goes offline for a very long time, the KeyServer will eventually enter a quit event for the program, but only after waiting a number of weeks before “giving up”. On the other hand, if a controlled program is launched and then the client goes offline, the corresponding license will be automatically returned after about 15 minutes, and at that point in time, a quit event is recorded for the program. If the program is detachable, it will continue to run on the client, and eventually after the program is quit, then when the client contacts the server, and offline, detached launch and quit will be recorded. With KeyServer and KeyAccess 6.0, these differences were more exaggerated and could be a problem for reporting. With KeyServer 6.1 and KeyAccess 6.1, the differences are minimized and reports deal with logged programs better in general.

- **Audited**

(green dot icon) - Programs which are set to Audited are shown in standard audit reports, but usage is not tracked at all (except for a last usage time reported as part of an audit). If a program is changed to Audited from Logged or Controlled, then usage events will no longer be added to the Usage database. Previously recorded usage events will remain in place.

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- Ignored

(grey diamond icon) - Programs which are set to Ignored are not shown in standard audit reports, and usage is not tracked. If a program is changed from Ignored to Audited, the audit data for the program will henceforth be shown in standard audit reports.

- Corresponding Program Action Settings from 6.0 to 6.1

<http://www.sassafras.com/hrl/6.1/new60to61.html>

There were no changes to program action settings between K2 v6.1 and 6.2

6.0 Setting	6.1 Setting
“Controlled” (blue square), “Audit”	“Controlled” (blue square)
“Controlled: (blue square), “Don’t Audit”	Not supported
“Logged” (yellow triangle), “Audit”	“Logged” (yellow triangle)
“Logged” (yellow triangle), “Don’t Audit”	Not supported
“Ignored” (green circle), “Audit”	“Audited” (green circle)
“Ignored” (green circle), “Don’t Audit”	“Ignored” (grey diamond)

- Program Details Window

http://www.sassafras.com/hrl/6.2/prog_details.html

The program details window displays the full configuration for any particular program variant selected from the programs window. For definitions of the terms “Program Version”, “Program Variant”, “Program Family” see the Programs Window Documentation.

<http://www.sassafras.com/hrl/6.2/programs.html>

- Left Side - Program Family

The left hand side of the details window shows a list of all variants comprising the entire Program Family. This lets you see how the family has been split according to the digits exposed in the variant mask and/or through the creation of “keyed variants”. Detailed information and configuration options for the selected variant are displayed on the right. The Actions and Information panes are always visible but other panes are toggled in or out of view and re-ordered using the small icons at the top right of the window.

- Right Side - Actions Pane

This is the most important pane in the program details window since it lets you configure the KeyServer’s basic Action concerning the selected program variant. Although the display on the left may list several variants with icons indicating a management action for each one, configuration changes on the right side have no effect beyond the selected variant - the one highlighted in gray. The drop down menu at the top of the Actions pane lets you select an action for the selected variant from Controlled, Logged, Audited, or Ignored.

- Licenses Window

- Keyed vs. Un-keyed

The legacy “keyed” method is optional, and unnecessary except when an organization wishes to prevent intentional software piracy.

The common practice among K2 administrators today is to use K2’s standard method of managing programs and their respective software licenses without installing keys. To do this, simply drag a Program record from the Programs Window into the Licenses Window - do not “key” it. The license management interface and usage tracking options available for the standard method and for the keyed method are the same.

- K2 effectively manages the three most common desktop license models: Site License, Node Locked License, and Concurrent-use (Floating) License. Plus K2 supports the new “Leased License” model for customers to use in negotiations with software publishers.

- Managing multiple Entitlements with multiple License Profiles or with Pools within a single License Profile

License Pools were designed for scheduling or report aggregation. Support for multiple licenses managing one program was added to K2 6.0. Choose multiple licenses whenever you can for simplicity of management.

- Scheduled license reservations

(Pool Level Attribute)

http://www.sassafras.com/hrl/6.2/lic_schedule.html

The additional options for a Floating License revealed by the triangle button in the Policy pane of a License Details window let you split license allocation among several “Pools” each with a license Limit and Group restriction specified. For example, you might want to assign a certain number of licenses for exclusive use within a particular computer lab. If use in the lab is only needed at specific times on certain days, you can schedule this exclusive lab restriction so that it applies only to the scheduled time while leaving a different allocation for all Unscheduled Times.

See illustration above for a scheduled lab period (MW 2:50PM-3:50PM) where two labs (“Adobe DS: FA-18” and “Hal Cook: CS3”) have 20 and 5 licenses reserved respectively and there are 79 licenses available during that period to anyone across campus who is a member of the “Adobe Design Std CS3” user group. There is also a single license dedicated to “Bellis”.

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- Background / Idle Time management

(License Level Attribute)

http://www.sassafras.com/hrl/6.2/lic_details.html#idle

Allows you to set idle time (background warning) settings for programs controlled by this license. Setting a nonzero value here sets a silent counter that starts on a computer using the license when all programs associated with that license are in the background. If the time limit is reached in this state the user is warned or licenses are reclaimed as you specify here. Note that after the license is reclaimed, depending on your settings, the user may be reminded a few times before the program(s) are shut down (though the license is available to others as of the timer expiration). If a program has a document window open with unsaved changes, the program will not be shut down but will instead be placed into "quit" mode allowing the user to either cancel and modify the document or quit with or without saving changes.

Note that this is a primitive mechanism and does not take into account any processing a program might be doing while in background; conversely a user continually resets the timer every time they bring that application to the foreground for even a moment.

That is, background/idle time reflects “time since the app was last in background” and can be reset n times during the use of a program. This is in direct opposition to “Timed Use (discussion follows), where the clock starts ticking at application launch and is in no way dependent on how many times the window for the program may, or may not, be in foreground.

- Timeout (a.k.a. “Timed Use”)

(Pool Level Attribute)

The Timeout field lets you set a timeout for license usage. If you set a value here the timeout counter starts when the license is granted and the license is reclaimed when the timeout is reached. If you want the license to be automatically checked out again in cases where no one is queued for a license when the timeout is reached, set the auto-extend checkbox (in the Options pane). This timer sets a limit on the total usage time, as opposed to the settings in the Idle pane, which let you configure a timer that limits the time a license can be idle (all controlled programs are put in the background) before being reclaimed.

- Custom Columns

In KeyConfigure 6.0, each window contained the columns which seemed the most useful to the most number of users. However, we often received requests for certain columns which were not shown, but which certain administrators wanted to be able to see, for one reason or another.

In 6.1 KeyConfigure, we introduced a new feature which allowed administrators to customize which columns would be shown in each window. There are many columns which are not shown by default, but which can now be added to the display. Likewise, any default column which an administrator is not interested in can be hidden.

Columns can also be re-ordered. Any window can have columns customized - just right-click in a column header within the window, and select “Customize Columns”. Most standard windows have additional columns which can be added to the default display. Some reports (but not all) also have additional columns.

This feature makes the information presented in KeyConfigure windows much more flexible and extensive. If you still feel that there is a column missing, let us know by emailing support@sassafras.com, since we may be able to add it in a future release.

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- **K2 Configuration**

- **Role- and Scope-based administration**

<http://www.sassafras.com/hrl/6.2/accounts.html>

In addition to a fully-privileged administrator account, K2 can be configured for role-based administrative access and scope-based reporting access to anyone within your organization. A single-button setting will limit any assistant administrator to “Report-only” access for convenient configuration of departmental reporting accounts.

- Role: Admin access limited to customized set of functions/tasks.
- Scope: Reporting access limited to a “Division” of computers.

- **Using Divisions, Groups, Folders, Filters, and Rules**

- **Divisions and Groups (Computers table)**

To understand the distinction between Divisions and Groups; Divisions are used for viewing and reporting purposes while Groups are used for access management.

Each computer is associated with exactly one Division. If no specific Division is applied then the computer will belong to the “Uncategorized” Division. Each computer, however, can be associated with multiple Groups that are managed in the Groups window.

One-to-one, one-to-many, many-to-one, and many-to-many relationships can all be created between Divisions and Groups simply by dragging Divisions into Groups.

- **Folders (Programs table)**

Folders in the Programs window have similar characteristics and behaviors as Divisions do in the Computers window. Folders can be used for viewing and reporting program records.

Software Program records can be placed into exactly one Folder. If no specific Folder is applied then the program will belong to the “Uncategorized” Folder.

- **Filters and Rules**

Filters can also be used for viewing and reporting records.

When a Rule is associated with a Filter, as each new computer or program is discovered, it will be checked against the series of existing filters/rules to determine which settings should be applied to the computer or program and what Division or Folder it should be placed into. This frees the administrator from having to decide what to do with every single computer and program as they are discovered.

The filters are tested in order, and the actions associated with the first matching filter are applied. Note that if a Computer rule sets a Division but not an Login type, the computer Login type will be set to the type associated with the default, “Discovered” Computer rule. Similarly, if a Program rule sets a Folder but not an Action, the program Action will be set to the type associated with the default, “Discovered” Program rule.

- **Program Filters - The concept of “there exists”.**

Each record in the Programs window potentially represents an aggregate of several individual program versions. A search filter looks for satisfaction based on ALL the individual versions within the aggregate. This can sometimes lead to confusing results.

For example, compare a [search for all programs that ARE published by Microsoft] with a [search for all programs NOT published by Microsoft]. Chances are that there exist program line items (i.e. program variants listed in the Programs window) that satisfy both searches! All it takes is a variant that includes one program version with Microsoft in the publisher field while a second program version (aggregated into the same variant) has no publisher in the publisher field. (Note: see “Stickies” example from sample data.)

- **Ignoring uninteresting programs: migrating from the admin style of 6.0 to 6.1/6.2**

In KeyConfigure 6.0, Discovered programs and Discovered computers were displayed in pink. The purpose of showing discovered Computers and Programs in pink was to allow administrators to quickly see what new items had been found since the last time they had looked at KeyConfigure. They could then assign the appropriate Login settings, Divisions, Actions, and Folders to each item, which would in turn remove the “Discovered” status from each item. This system helped K2 administrators identify and categorize items as they were discovered, but still required them to look through thousands of items.

K2 6.1 introduced the ability to associate Rules with Filters. Rules are applied to newly discovered Computers and Programs only. Or they can be reapplied to “Unacknowledged” Computers or Programs for rapid reorganization of the Computers or Programs tables.

Program Rules will automatically categorize Programs between three of the four program action settings (Logged, Audited, or Ignored, but not Controlled) and Computers between three of the four client computer settings (Dedicated, Leased, or Excluded, but not Dormant) as each computer and program is discovered. You can alter settings to fine-tune the results. The correct categorization of computers and programs then helps make reporting and configuration of software audits and licensing status easier and quicker.

To aid in accomplishing these goals, K2 6.1 and 6.2 both provide two default Program Rules that will quickly identify the majority of programs that you may be interested in managing.

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- Clean up steps to ignore more programs

- 1 Set Action on Program Discovered Rule to Ignored
- 2 Set Action on “Win Programs” and “Mac Programs” filters to Audit
- 3 Place all “Logged” programs into a folder to protect them from becoming Unacknowledged by the next two steps
- 4 Hold Option/Alt key and right-click the “Uncategorized” folder and select “Unacknowledge” from the pop-up menu
- 5 Run Rules

- Software product management vs. software programs

License profile records are created and defined by K2 administrators. Each License will impose usage limits and access restrictions on a program or group of programs (product suite). A License can limit the number of programs which can be used to the number of copies which have been purchased - both for per-device (node-locked) and concurrent use (floating) licensing. Licenses can also restrict who has access to programs, when, and for how long.

Unlike the Computers, Programs, and Users windows, items are never automatically added to the Licenses window, as these records must be created by the K2 administrator to reflect a combination of the software entitlements that the organization owns and the management preferences of the organization.

In many cases, a program will be controlled by a single License. In turn, this License will control only that one program. However, since many programs are packaged by software publishers into more than one software product title, a program often should be controlled by multiple Licenses. And likewise, since many software products include more than one program (commonly referred to as a “suite”), each License can control multiple programs.

In short, a License can be thought of as a particular set of access and usage rules being applied to one or more items in the Programs Window. When a user attempts to run a controlled program, each License which controls the program is consulted to determine whether access will be granted to the program.

A common mistake that software administrators can make is to configure each individual program of a product suite to be managed by an individual License profile. To rectify this configuration error, a K2 administrator should aggregate programs correctly by product titles.

- Managing multiple versions of a program (K2 variant mask)

http://www.sassafras.com/hrl/6.2/prog_details.html

KeyServer collects information about each distinct version of a program. For simplicity in managing programs, the items you see listed in the programs window are “Program Variants”, which group together multiple specific versions of a program, and allow you to ignore the uninteresting detail of which precise version is installed or used. All versions of a program are part of the same “Program Family”, even if they have been divided into multiple variants. By default, all major and minor release versions of each program are part of a single variant, but this can be configured in the program details window, e.g. so that each major version of a program is a separate variant.

- Program Family

By default, multiple versions of the same program are grouped into a single “family” in the program list. All program files that have the same “program Identifier” are considered to be in the same family. On Windows, the program identifier is based on the file property called “Original File Name”. On Macintosh, the identifier is the four character application signature plus the four character file type (usually “APPL”). For KeyServer purposes, Windows and Macintosh programs are always considered to be in different families (e.g., all versions of Excel on Windows are in one family, while all versions of Excel on Macintosh are in a different family). The two families are distinguished by platform icons in the program list.

The initial name for a program is taken from the particular program file that was discovered first in the family. On Windows the name comes from the “Product Description” property in the Version information. If this property does not exist, the file name is used (displayed in italic font). On Mac, the file name is used. In either case, KeyConfigure attempts to strip off any version suffix (numeral characters) in order to name the family in a generic way.

- Program Version

A program family contains all the known versions of a program. The version is determined directly from the Version resource of an executable file as assigned by the developer of the program. If the developer does not assign a version, KeyServer will record it as version 0.0.0.0.

For the vast majority of programs, the family identifier and the complete version number fully identify an executable. There are some cases, however, where different executable files within a family have the same version number. In these cases, the size of the executable file can be used to further distinguish different versions of a program.

- Program Variant

Often you will want to manage all versions within a program family as a single unit, without making a distinction between the versions. However, KeyConfigure does give you a way when necessary to split the family into several “variants” so that they may be assigned different actions or otherwise managed separately. Generally, only the first one or two digits from a version number will be used to distinguish separate variants from a program family, although you do have the option to use all digits of the version (and even the executable size).

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When a family is split into separate variants, each variant is listed separately in the Programs window. Even though the Identifier for several variants may be the same, when taken together with the Version field each variant will be uniquely identified and can be managed independently. For this reason, the list in the Programs window might more accurately be called the “program variants list”. Note that two unrelated programs may have the same name - you should not expect program names to be unique.

When a program family has not been split into separate variants, the Variant column will not show a version number. If more than one distinct version has been discovered for the program family, the Variant column will display the text “all” in a light grey font. Otherwise, with just one discovered version, the Variant column for the family will be left blank.

For example, suppose the FileMaker program for Windows has been discovered by KeyServer. Rather than treat all versions in the same way, you may want to treat FileMaker versions 5.x.x differently from FileMaker versions 6.x.x. You can double-click on the FileMaker item to expose its details window where the Actions pane lets you slide the version mask right to include one digit of version information. Then the two variants will appear in the Programs window and the version column will display “5.x” for one variant and “6.x” for the other.

- **Configuring multiple license entitlements for the same program**

http://www.sassafras.com/hrl/6.2/lic_details.html

Many organizations will purchase just one type of license entitlement for each software product their organization uses. But when more than one entitlement is licensed for the same software product, multiple License profiles can be created and configured separately to manage entitlements for separate groups of end users.

With multiple License Details windows open programs can be dragged from one License Detail programs pane to another. This will configure multiple licenses controlling the same application. This must be done with a careful understanding of the exact order in which a program chooses a license from among multiple possibilities. Typically there is just one license listed for each program in the License pane of its Program Details window, but when there is more than one, you can adjust the ordering to achieve the precise behavior intended.

Example:

- **Managing Adobe Design Standard with Master Collection, Web Premium, Production Premium, and Acrobat Pro**

- **Tip: Finding all of the programs that belong to an Application Title**

The task of locating every program that belongs to one Application Title (Program Suite) can be confusing at times. It helps to become familiar with the installation habits of different software publishers. For example, Microsoft Office applications are almost always installed in a common home directory inside the standard Programs (Win) folder or Applications (Mac) folder. Adobe, however, typically installs each individual application from their suite products into their own directory.

The common practice for both of the above scenarios is to use an identifiable string from the path name. Microsoft Office 2008 (Mac) can be found by using the path string “Microsoft Office 2008”. But Microsoft Office 2007 (Win) is found by using the string “Office12”. For Adobe software, all CS3 and CS4 applications except Acrobat can be found with the path strings “CS3” and “CS4”. But Acrobat doesn’t follow this convention.

I will demonstrate how to easily make use of path strings with the “Find” command in the Programs window.

- **Lab Management, scheduling, and license reservations**

http://www.sassafras.com/hrl/6.2/lic_schedule.html

The additional options for a Floating License revealed by the triangle button in the Policy pane of a License Details window let you split license allocation among several “Pools” each with a license Limit and Group restriction specified. For example, you might want to assign a certain number of licenses for exclusive use within a particular computer lab. If use in the lab is only needed at specific times on certain days, you can schedule this exclusive lab restriction so that it applies only to the scheduled time while leaving a different allocation for all Unscheduled Times.

For example, based on a defined Group of lab computers, you could restrict some Photoshop licenses to a pool for exclusive use in the lab from 2:30 to 3:30 on Wednesday afternoons. For other Unscheduled Times, all licenses would be available for use anywhere.

Note: If too many licenses are already in use when a lab schedule takes effect, then KeyServer may have to reclaim a license from an outside user - this is only done if actual demand in the lab requires it. The oldest outside user will experience a “please save your work and quit” message. Like the “Reclaim License” message that the admin can send explicitly to a particular user (from the Users Window), unsaved work in an open document is never put at risk. The schedule feature of a custom license is the one case where a new license allocation takes precedence over an existing allocation and therefore an existing allocation may have to be preemptively reclaimed.

- **A Deeper Dive into using Groups with K2 v6.2**

- **Five ways to define Groups**

<http://www.sassafras.com/hrl/6.2/groups.html>

There are four ways to define Groups locally within KeyServer: Locations, Nodes, Divisions, Filter. A fifth way to define groups is externally, through the use of Authentication modules. See: <http://www.sassafras.com/hrl/6.2/authentication.html>

Group membership is determined by an OR of various conditions. When a license is launched which has a group restriction, each condition for the group is checked, and if any of them are met, group membership is satisfied, and the license can be granted. Group membership can be given either because the computer is in the node list for the group, it is in a Division which is associated with the group, it is in a Location which is associated with the group, it matches the Filter defined for the group, or the authentication module recognizes the

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computer or user as a member of the group.

Currently, it is important to note that the Group Details Window does not show any indication of whether this group is a valid group according to the authentication module. It does, however, list Computers, Divisions, and Locations which are associated with the group, and the filter pane lets you display a window showing those computers which match the filter.

The Filter method is new with K2 v6.2. It is a powerful method that can be used in many creative ways, including the ability to define the compliment (or opposite) of any other Group.

See: <http://www.sassafras.com/hrl/6.2/filters.html>

- **Authentication**

<http://www.sassafras.com/hrl/6.2/authentication.html#Heading21>

Authentication is one of the most powerful features offered by the KeyServer Package, but it is also one of its most complex. While it can greatly enhance control of programs, authentication can also make the configuration process more involved. Before using the authentication features of KeyServer, carefully read the page referenced in above's web link.

Authentication can accomplish two basic functions. First, it can be used to allow or disallow users from connecting to the KeyServer at all. Second, it can allow group membership to be determined by a name and password, rather than simply location or the identity of specific computers. These groups can in turn be used to control who can use each license.

For most purposes, license control and reporting based on the computer ID is completely adequate. Before you consider adding an authentication requirement (e. g. changing the default from “All Authent” to one of the modules below), check the documentation on how to define Divisions and Groups based on computer ID alone without authentication.

- **Four Scenarios**

- Allow everyone to connect, and don't use authentication for group membership.
Use the default authentication module, All Authent.
- Restrict who can connect, and don't use authentication for group membership.
Use any authentication module besides the default module, All Authent. The module may or may not support groups. Make sure that guest access is disabled.
- Allow everyone to connect, but use authentication for group membership.
Use an authentication which supports groups, but enable guest access so that even those who do not have a name and password can still connect (but will not be authenticated into any groups).
- Restrict who can connect, and use authentication for group membership.
Use an authentication which supports groups, and make sure guest access is disabled, so that only those who are successfully authenticated can connect.

- **The Authentication Modules**

- All Authent
- Single Password
- Text Authent
- Kerberos
- LDAP
- Windows NT
- SQL
- KS NDS
- Unix

- **Using Active Directory for authentication**

Active Directory Authentication is supported using either the Windows NT or the LDAP module. There is no special Authentication module needed for Active Directory. If your KeyServer is running on a Windows computer, it is easiest to use the Windows NT module (although you can use the LDAP module). If your KeyServer is not running on Windows, you must use the LDAP module. See the relevant sections above for configuration details.

Active Directory Authentication, and other authentication processes that have the capability of identifying User (and not just Computer) make it possible to define “User-based” license entitlements in KeyServer - or a software license entitlement that follows a User (to any computer) rather than restricting to one computer.

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- Special Workflows and Processes with K2

- Virtual Computing and K2

K2 supports many virtual computing environments. Examples offered below for Desktop and Server Virtualization are simply separately partitioned operating systems hosted on a single physical computers. These examples are treated as independent computers by K2. They are licensed separately as individual clients on K2 to the extent that their computer ID is masked by the virtualization process. For example, while Parallels and VM Ware OS's are treated as different computers than their physical hosts, 'Dual Boot' Macs are treated as a single computer which sometimes logs on as a Mac and other times logs on as a Windows computer.

As software publishers evolve their various technologies for virtual computing some distinctions in virtual models have become blurred. Thus some products appear in both the “Application Virtualization” and the “Presentation Virtualization”, formerly known as “ThinClient”, categories.

K2 supports all Presentation Virtualization (“ThinClient”) technologies that we know of. K2 also supports Microsoft Application Virtualization, “App-V” (formerly known as SoftGrid and Softricity), VMware ThinApp, and at last test, Altiris Software Virtualization (now known as “Symantec Endpoint Virtualization Suite”). K2 may also support other virtualization products of which Sassafra is unaware.

We invite customers to contact us to report their experiences with these, and other, virtualization technologies.

- Five Common Types of Virtualization

- Server Virtualization

Separately partitioned server Operating Systems hosted on a single physical server.

Examples:

Microsoft Virtual Server

VMware ESX Server

- Desktop Virtualization

Separately partitioned operating systems hosted on a pc and/or delivered to a pc from a host server.

Examples:

Parallels Workstation & Parallels Desktop for Mac

VMware Workstation & VMware Fusion for Mac

Citrix XenDesktop

Sun xVM VirtualBox

VMware View

- Application Virtualization

Running a software application in an encapsulated environment separated from the host operating system.

Examples:

Citrix XenApp (formerly Presentation Server or MetaFrame)

Microsoft Application Virtualization (formerly SoftGrid or Softricity)

VMware ThinApp

Symantec Endpoint Virtualization Suite (formerly Altiris Software Virtualization Solution)

InstallFree

Xenocode

Zero Install

- Presentation Virtualization (formerly ThinClient)

Applications or whole OSs that are presented visually at a computer but whose processes are running on a remote server host.

Examples:

Citrix XenApp (formerly Presentation Server or MetaFrame)

Citrix XenDesktop

VMware View

- Cloud Computing

Cloud Computing is a different breed of Virtualization, Cloud Computing provides dynamically scalable, virtualized resources as services over the Internet. While it makes virtual resources available, it is distinct from other common forms of virtualization in as much as all of its resources are provided through service models (e.g. SaaS - Software as a Service).

- Software Licensing in the Cloud

- “Subscription” Licensing in a Services environment is not “Software Licensing”.

- The Metric changes from License Management to Service Measurement.

- IaaS - Infrastructure as a Service

- PaaS - Platform as a Service

- SaaS - Software as a Service

- Utility Licensing models are not always what they appear.

- “Utility” licensing is an economical, “on-demand” licensing model that is associated with SaaS. When correctly applied, it is a usage-based model, sometimes aligned with business process demands. The name is drawn from the analogy of being able to pay for software the way you would for utilities such as electricity, gas and water.

- Utility licensing is sometimes used to support a SaaS computing model. However, more commonly, the still immature SaaS models

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employ corrupted models of utility pricing where numbers of consumers (seats) are counted rather than consumption – as a true utility company would charge. If your power company charged for their services that way, you would pay them based upon the number of light bulbs and electrical appliances you have rather than on the amount of electricity you actually use.

Some licensing models offered under the name of “Utility” licensing are simply the same choices we have seen for years that are trotted out under a new and fashionable name, but they don’t fit the implications of the name. Instead, they use metrics such as: high water mark (concurrent-use), unique user (“per-user”), token based (most confusing because it is sometimes interpreted as node-locked and other times as concurrent-use or leased). None of these examples are true “Utility” models.

Due to continued misuse of the terminologies, the phrase “Utility licensing” will probably decline in use in favor of the even less descriptive “SaaS licensing”. It should never be assumed that there is only one general type of “SaaS” or “Utility” licensing. They are simply cover phrases for a multitude of - correctly or incorrectly represented - licensing models.

- **Some Software Licensing issues in Virtualization**

- Most software publishers do not yet provide specific licensing models for applications installed or used on virtual computers or in virtualized environments.
- Some publishers license software for their own virtual environments but not for other vendor environments. Or they provide more favorable licensing terms for their own environments than for others.
- Until more software publishers present specific licensing models to support virtual computing, SAM practitioner practices can not be clearly delineated.

- **Auditing Application Servers**

<http://www.sassafras.com/hrl/6.2/serveraudits.html>

By default, client computers do not report software applications stored on remote volumes. This avoids redundant reporting from multiple clients. With the standard K2 client install, the client component only runs when a Windows user account is actively logged in. It tracks programs launched and quit by the logged in user. Whenever the KeyServer has a pending audit request, an incremental audit is initiated and uploaded. Since a typical file server rarely has a Windows user account logged in, the K2 client software can be configured to periodically check for pending audit requests even when there is no user currently logged in.

- **Hardware Asset Management**

- **Hardware Properties, Hotfixes, Embedded Asset Tag data**

K2 v6.2 collects many more hardware properties than earlier versions. KeyAccess 6.2 for Windows collects Windows OS hotfixes (security patches). A new series of “Hotfix” reports provides extensive information on which computers have received, or not received, each Hotfix. Hardware Asset Tag data can now be embedded into each computer’s Registry settings (Win) or Plists (Mac) for automatic collection at each logon.

- **Using Filters to target special classes of computers for hardware management tasks**

KeyServer can be used to identify computers that match any hardware configuration setting and/or organizational classification that is known to the KeyServer. For instance, you may instantly generate a list of all computers with a certain level of RAM installed, or less than a certain amount of hard drive space available, or clock speeds higher or lower than a certain threshold.

You may also pair the above classifications (and many others) together with organizational details, like restricting a report to a certain Division (‘computing labs’ or ‘Media Center’, etc).

- **How many of my “Autodesk” computers are ready for an upgrade?**

Demonstration of Hardware Report executed on Computer Node List for Autodesk License.

- **Four Academic Use Cases for License Management**

- **Lab computers**

Usually the easiest to manage because all installed software is typically owned by the institution and the computers are controlled/imaged by institutional IT support staff.

- Hardware and software owned by the institution. Administrator has full rights and management responsibility.
- Deployment tools/processes (Symantec Ghost, Deep Freeze, etc) used to control the environment including either keyed or unkeyed installation.
- K2 enforces License compliance for Site licenses, Node-locked, Concurrent-use according to purchased Entitlement rights. License compliance is singularly managed by the institution.
- Version updates are easily managed by installing unkeyed programs (secured by user permissions), or with keyed programs and deployment tools to manage updating (while prohibiting or disabling the update checking feature of applicable applications).

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- **Staff computers**

A little more difficult to manage as some software may be purchased by academic/administrative departments or even by individual employees with college credit accounts (not always centrally purchased).

- Hardware and software is typically owned by the institution, but management rights may be shared between IT staff and the end user.
- Software deployment may be handled in a variety of ways with a mix of various deployment tools and end user installed software.
- K2 enforces License compliance for Site licenses, Node-locked, Concurrent-use according to purchased Entitlement rights. License compliance is typically managed by the institution.
- Version updates are easily managed by installing unkeyed programs. Securing against piracy is not as critical of an issue on staff computers (unlike labs) - so installing keyed programs is of less interest.

- **Faculty computers**

Most difficult of the four cases to manage because various installed software products may be purchased centrally by the institution, or by an academic department, or under grant funding (owned by the grant and not by the University), or by the faculty member who uses the computer. (typically purchased by diverse groups).

- Hardware and software ownership can be a mix of institutional, grant, and/or personal ownership.
- Software deployment may be handled in a variety of ways with a mix of various deployment tools and end user installed software.
- Mixed responsibility for license compliance management. K2 might be used to provide access to some software products while many other installed products are either unmanaged or licensing is the responsibility of the end user.
- Version updates for institutionally owned software become more complex, as does access management of all programs managed by KeyServer. If the end user is provided access to KeyServer controlled software, they must continue to receive uninhibited access to personally owned/installed software.

- **Student computers**

It is rare for software license agreements to allow software products to be installed on student computers unless properly managed under specific guidelines. Generally such arrangements are simplest to manage if there is a central licensing process in place that prohibits access to institutional owned software under appropriate circumstances (student graduates or leaves school, student leaves academic program to which software is granted, or simply if student is off campus). (Example: Sheridan College.)

- Two subclasses: 1. Hardware and software owned by institution and leased to student. 2. Hardware and software owned by student with some software provisioned through KeyServer.
- Subclass #1 is virtually identical to a Lab computer with rights limited to guest access. Hard disk images are commonly managed by central IT staff.
- Subclass #2 is similar to Faculty computers with complex solutions for updates to institutionally owned software.

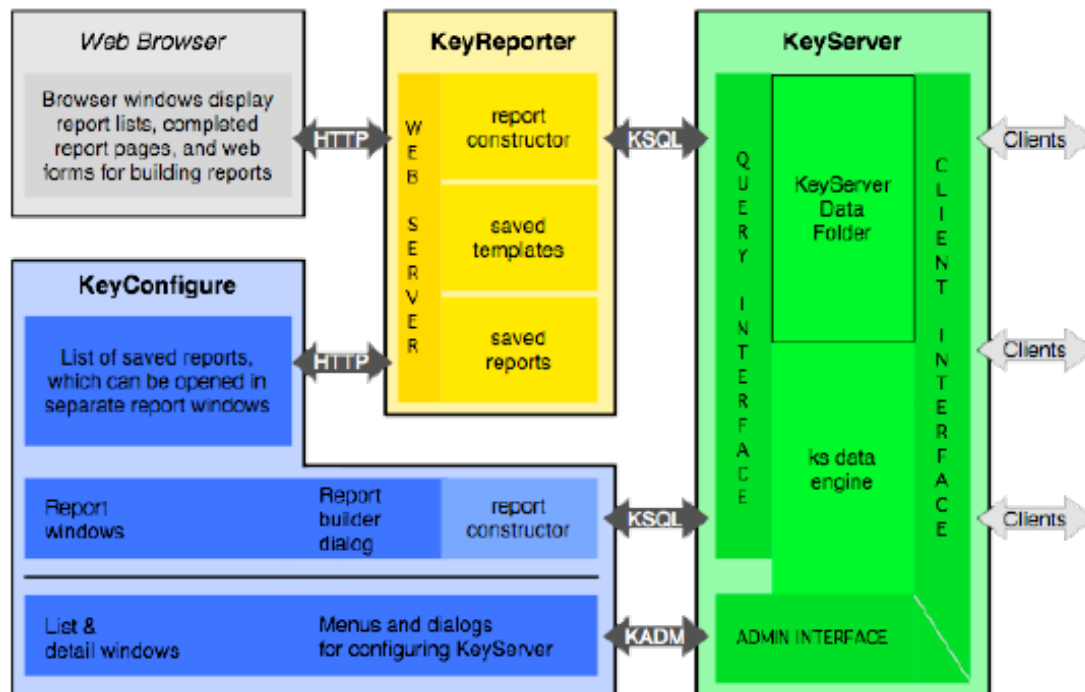
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- KeyReporter web reports, RSS, and custom web interfaces

<http://www.sassafras.com/hrl/6.2/keyreporter.html>

KeyReporter, K2's Web Reports interface, is run as a service that you configure to automatically run K2's usage and audit reports on a schedule. KeyReporter publishes its archive of completed reports in html format for viewing with any web browser. The archive of KeyReporter saved reports can also be viewed using the admin component, KeyConfigure. When viewed in KeyConfigure, these reports are fully integrated into the administrative interface (e.g. with support for drag & drop etc.) just like reports initiated directly from a KeyConfigure menu command.

The KeyReporter process interacts with the KeyServer process (and its databases) in much the same way as KeyConfigure. But unlike KeyConfigure, the KeyReporter process itself has no user interface - instead, a web browser is used as the front end for defining report templates, specifying scheduled run times, running reports, and accessing the archived the results.



As illustrated in the diagram above, the combination of a Web Browser plus KeyReporter is roughly equivalent to the reporting functionality implemented by KeyConfigure alone. Use your favorite web browser to connect to the KeyReporter web server process- the url is the ip address (or a DNS name) of the computer hosting KeyReporter.

KeyReporter is an optional component included in the K2 toolkit - the same set of “report modules” is used by KeyConfigure to display usage and audit summary reports in its own windows without using a web browser. When the usage and audit databases become large, however, some reports may take a considerable time to complete. Then it will be convenient to instruct KeyReporter (using a web browser) to run these same reports on an overnight schedule - perhaps automated to produce weekly or monthly summaries. Access to KeyReporter's archive of completed reports from either a web browser or KeyConfigure is an additional benefit.

KeyReporter can be configured to automatically run scheduled reports. It provides a web interface to the reports that can be accessed by administrators and “assistant” administrators using Role- and Scope-based access.

Note: KeyReporter provides an RSS interface to conveniently feed auto-generated reports to specific administrator accounts. This is very useful especially if you would like to feed reports to departmental managers who do not have configuration access to KeyConfigure.

- Following are a few reasons to become familiar with KeyReporter
 - To allow web access to reports from anywhere (so an install of KeyConfigure is not necessary if all you need to see is reports).
 - To schedule reports which have to run every week, month, or year.
 - To schedule time consuming reports to run at non-peak hours.
 - To write simple “status” reports that change frequently (Division Activity).

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- Integration with External Systems

- External Reports (Crystal, Access, etc.)

http://www.sassafras.com/hrl/6.2/external_reports.html

In addition to the “internal” reports available from KeyConfigure, you can also query K2 data tables using your favorite “external” SQL reporting tool. This capability lets you build your own reports with customized formatting and data summaries. Since most SQL reporting tools can query data from multiple data sources, this feature might also be used to build a custom report that joins any of K2’s databases to other corporate databases.

Regardless of what platform is hosting the K2 server process, there is no need to export K2 data in order to query the data using an external reporting tool. You can use any external reporting tool that can be configured to send SQL queries through ODBC - you must have set up a DSN (Data Source Name) that is configured to use the KeyServer Driver, ksODBC. Queries will be translated and conveyed to the K2 server through the ODBC driver. K2Admin.exe for Windows installs the KeyServer Driver by default - this installer can also be used to install just the ksODBC driver and external report examples without installing KeyConfigure.

- Flexible IT Data Integration (“To export or not to export”)

<http://www.sassafras.com/hrl/6.2/exporting.html>

K2 does not require any back-end data services from the host OS or third-party processes. The tight integration with its self-contained data server provides for extremely easy deployment of a complete solution. But if your requirements include integration with existing IT operations tools, or you need custom reporting, K2 supports this integration through the following flexible, industry-standard interfaces.

- External Data Linking & Custom Reports

K2 data can be live-linked to external IT management, procurement and help-desk systems with flexibility limited only by your imagination. Data export is not required since K2 includes an ODBC driver that will funnel external SQL queries directly to the K2 database server. Industry standard reporting tools (e.g. Crystal Reports, Remedy, Microsoft Access, etc.) can be used to directly query live K2 data while also joining to other data sources.

- Export to External Database Server

When a dedicated, high-end, sql database server is available, you may want to take advantage of its performance when querying large data sets. Also, custom reports that join to external data may be easier to optimize when all of the data sources are hosted on a single dbms. K2 can mirror its data onto an external database server such as Oracle, SQL Server, or any target accessible through an ODBC driver. Then K2’s built-in reports can simply be pointed to the external data source and they will continue to work from within the Admin console along side any of your own custom external reports.

- Tips & Tricks, Tech Notes, and Common Technical Topics

- Duplicate Computer Records

Duplicate Names (COMP)

<http://www.sassafras.com/hrl/6.2/reports.html#misc>

Duplicate computer entries occur when a single client computer is unreliable in recognizing hardware properties such as MAC address. KeyAccess on that computer may start out using one computer ID, but then be forced to switch IDs when the hardware properties appear to have changed.

If the report gives the message “No data to report on”, it means that your data does not contain any duplicate computer entries.

If the data in a column is displayed in bold, then the computer ID for the computer is based on that piece of data. For example, if the MAC column for a particular computer is in bold, then the computer ID is the letter “N” plus the MAC address. If the value is also dimmed (medium grey instead of black), then the computer record doesn’t actually have a value recorded for this property, but it is displayed in the report since it can be inferred from the computer ID.

The “Dup?” column lets you sort apart the computers according to what type of entry this report has guessed that they are. If this column is empty for a particular computer, it means that this computer record is almost certainly still in use, and should not be deleted. If the column contains a question mark (?), then this row shares the computer name with another entry, but has a distinct MAC address. This means that the computer could be a duplicate entry which should be deleted, or it could be a unique entry which simply has the same computer name. For these rows, you should sort by name, and compare this row to other rows with the same name, to see if other hardware properties match or are distinct. If the column contains a red “x”, then this row is almost certainly a duplicate and should be deleted. Not only does it share the computer name with another entry, it also has the same MAC address (or the other entry has a MAC address and this entry has no known MAC address).

This report is intended to be used in order to identify and delete duplicate computer entries. After running the report, it is recommended that you create a new computer division, to temporarily move duplicates into. Then sort the report by the “Dup?” column. Scroll to the bottom and select all the computers with an “x” in that column, then drag them to the new division. Now you can filter the main computers window to show only those computers in the new division, select them all, and cut them (delete them).

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- **Notes about old KeyAccess client versions**

Sassafras recommends that you always run the latest client versions whenever possible. If you are running 5.x client versions, duplicate computer records will almost certainly reappear after you resolve them. If you are running KeyAccess 6.0 on Windows computers, duplicate computer might be likely to recur. Thus, you should always upgrade old client versions as a first step to repairing duplicate entries.

- **Steps to resolve**

- Run the Duplicate Names (COMP) and sort by Name

- Right-click the column header and make sure the ID column is displayed on the left, somewhere where it's easy to see.

- If the duplicate records display alternating “C” and “N” ID's (one for each of a pair of dupes), and if the N-records are the older ones (ie they've changed from N to C), it's likely that the duplicates are image-related. You should check the “Cloning a master computer image” documentation at <http://www.sassafras.com/hrl/6.2/clone.html> to see whether you imaged/pushed the clients properly. Delete the older N-records.

- If duplicate records both display “N” ID's (both instances of a given pair are N-records) it may be a power management issue on client computers with wireless (powered up with on-board network card turned off). Delete the older onboard records.

- Any other instances, contact Sassafras technical support

- **Rapid Deployment of KeyAccess client software**

<http://www.sassafras.com/hrl/6.2/deployment.html>

At sites that have a large number of K2 client installs to perform, manually running the client installer on each computer may be impractical. This document references some techniques, tools, and documentation that facilitates large scale deployment.

- **Large scale deployment methods**

Cloning a Master Computer Image:

<http://www.sassafras.com/hrl/6.2/clone.html>

K2 Client Deployment: General purpose deployment tools (SMS, Active Directory GPO, Apple Remote Desktop, etc.)

<http://www.sassafras.com/hrl/6.2/deployment.html>

Customized Client Install with site specific preferences:

<http://www.sassafras.com/hrl/6.2/k2clientconfigW.html>

<http://www.sassafras.com/hrl/6.2/k2clientconfigM.html>

- **TN 3704: Custom “Deep Freeze” configuration to avoid interference with KeyAccess**

<http://www.sassafras.com/hrl/6.2/tns/tn3704.html>

The K2 client, KeyAccess, writes data to local private files in order to remember important state information such as Offline Usage Events. If Deep Freeze is used on the same computer as KeyAccess, it must be configured to avoid overwriting this private data.

- **TN 3695: KeyAccess configuration for “Microsoft Application Virtualization”**

<http://www.sassafras.com/hrl/6.2/tns/tn3695.html>

KeyAccess 6.1.4.3 (or better) provides full support for applications running in a Microsoft Application Virtualization environment (aka App-V, formerly SoftGrid). Both keyed and unkeyed program launches can be tracked.

- **TN 3701: K2 Dialog box messages (Error Messages)**

<http://www.sassafras.com/hrl/6.2/tns/tn3701.html>

This technote describes the various error, warning, and informational messages that may appear in dialogs while using KeyAccess, KeyConfigure, and other software components of K2: KeyServer & KeyAuditor.

- **KeyReporter Format**

Some KeyServer administrators like to change the format of the KeyReporter saved reports:

By default KeyReporter will send the saved report in HTML format. The URL for viewing a saved report is something like this:

<http://keyreporter.domain.com/archive-sched/4780675f-00000010.ksr>

To get the saved report as a tab delimited text file, that URL becomes:

<http://keyreporter.domain.com/archive-sched/4780675f-00000010.ksr?format=2>

Similar thing if you want it in xml:

<http://keyreporter.domain.com/archive-sched/4780675f-00000010.ksr?format=1>

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If you are also interested in getting the list of saved reports, that is available as a standard RSS feed (XML format) via this URL:

<http://keyreporter.domain.com/feed.rss>

There are also ways to get this list in other formats if that is needed. Contact Sassafras technical support if you have questions.

- **KeyReporter Guest Access**

<http://www.sassafras.com/hrl/6.2/accounts.html>

To enable public “Guest” viewing of reports saved in the public archive, you must assign a “KeyReporter Guest” account password:

1. If you have https turned on, use a browser to go to the Config page using https and enter a password in the “Guest Account” area, then click Apply. Alternatively, open the “kr.conf” file (in the KeyReporter Data Folder) with a simple text editor and replace the dummy string, “GuestPasswordGoesHere” with your choice of password to be assigned to the “KeyReporter Guest” account. The colon character (at the end of “KeyReporter Guest:”) and the angle bracket (at the beginning of “</string>”) must remain as the immediate characters surrounding your password string - and remember not to use the forbidden characters mentioned above.

2. In KeyConfigure, use the “KeyConfigure Accounts ...” menu item (from the Admin Menu) to select the “KeyReporter Guest” account from the drop-down menu. Use the “Edit...” button to enter the password - it must exactly match the value assigned in step 1 above (but without the delimiter characters, angle bracket and colon). Note: by default, the KeyReporter Guest account is already set up as a “Report Only” account with privileges appropriate for read-only access to web reports saved for public access.

If KeyReporter is running when you edit “kr.conf”, you will have to stop and restart KeyReporter after you have finished editing.

- **How to make sure all Clients can find the KeyServer**

Ideally KeyServer should be in a readily available location, but behind a firewall. The ports that should be open are:

UDP 19283
UDP 19315
UDP and TCP 19283

KeyServer is able to bind to all available IP addresses on a multi-homed host. However in some cases organizations might want to control which IP address KeyServer uses. To limit KeyServer to a single IP address, first set up a DNS name for that IP address. For KeyServer hosted on Windows, in RegEdit add a string value named “HostName” in the key SYSTEM\CurrentControlSet\Services\KeyServer. The value of the string should be the DNS name from the first step.

For KeyServer hosted on Unix (Mac OS X, Linux, and Solaris), modify the script that starts KeyServer, adding the “-n” option as: “./ks -n [DNS name] [other options]”

Restart KeyServer and it should bind only to the address assigned to that DNS name.

Note also that shadows may have no choice but to tell KeyServer a different address than the site wants the clients to use when trying to contact that shadow. A shadow and server behind the same NAT may agree that the shadow’s address is 192.168.0.1, while the clients on the other side of the NAT will only be able to see the shadow on address 10.1.2.3 or via a DNS entry. Since the server will push out the 192.168.0.1 (useless) address to the clients, the clients have to be configured with the 10.1.2.3 or DNS.

KeyAccess/Win:

Can read shadow locations from the keyacc.ini file, under the section named with KS’s address. So, if the KeyServer address is 10.1.2.3, and there are shadows at shad1.domain.org, shad2.domain.org, and 10.3.2.1, you could do this:

```
[10.1.2.3]
shadows= shad1.domain.org shad2.domain.org 10.3.2.1
```

KeyAccess/X:

Can read shadow locations from com.sassafras.KeyAccess.plist. In this case there is no server address, just the plain “shadows” key:

```
<key>shadows</key>
<string>shad1.domain.org shad2.domain.org 10.3.2.1</string>
```

On both Macintosh and Windows, KeyAccess will first search through the Shadows specified in the ini/plist files, according to their “distance” from the client. If none of these Shadows are available KeyAccess will search through the list of addresses that the server provided, according to their “distance” from the client. (The “distance” is not really a network-topology distance, but rather a simple comparison of the difference between the numerical addresses of the client and the Shadow.)

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- **Case Study: Nine Years of ROI using K2-KeyServer at University of Wisconsin**

Joe Smith, one of the K2 administrators at University of Wisconsin-Milwaukee, kept records for nine years on software and maintenance cost reduction as a result of using K2. His work contributed to a joint case study together with Bob Jones University. The full study, titled "From Software Cost Control to Cost Reduction: The Power of Usage Tracking", is available online at <http://www.sassafras.com/sam/>

Return on Investment: K2 - KeyAuditor & KeyServer									
University of Wisconsin									
Migrating from 1,000 computers in 2001 to 7,500 computers in 2008.									
Software Products	2001	2002	2003	2004	2005	2006	2007	2008	Totals
Concurrent Use License Savings - Adobe, EndNote, AutoDesk, and other products									
All products, this group	\$65,000	\$116,902	\$59,114	\$255,452	\$91,964	\$353,241	\$111,742	\$485,902	\$1,539,317 ¹
Savings from K2 managing Concurrent Use Licensing									\$1,539,317
Volume/Per-seat License Savings									
All products, this group	\$31,400		\$78,456	\$41,000	\$117,024	\$41,088	\$114,872	\$54,408	\$478,248
Savings from K2 tracking/reporting per-seat Licensing									\$478,248
Self-managed & Proprietary License Managers									
Maple		\$4,860	\$5,760	\$5,760	\$6,984	\$6,984	\$7,200	\$7,200	\$44,748
Mathematica	\$5,400	\$5,400	\$5,400	\$6,800	\$6,800	\$6,800	\$8,640	\$8,640	\$53,880
MatLab				\$2,750	\$4,250	\$3,500	\$6,825	\$11,200	\$28,525
Other Software		\$2,330	\$690	\$2,380	\$3,068	\$1,912	\$3,288	\$1,664	\$15,332
Savings from K2 tracking/reporting Proprietary Licensing									\$142,485
Total Savings from K2 tracking or managing Licensing									\$2,160,050
Sassafras K2 costs	-\$15,600	-\$2,333	-\$12,333	-\$9,633	-\$22,491	-\$27,101	-\$24,400	-\$28,205	-\$142,096
Total Investment in K2 - KeyAuditor & KeyServer									-\$142,096
Total Return on Investment - Eight years of using K2 - KeyAuditor & KeyServer									+\$2,017,954
<small>Note: ¹ \$835,567 of this item was not a budgeted expense. Total savings in this category includes software support that would not have been possible to purchase without K2.</small>									

- **Reference Materials for Further Study**

- Sassafras SAM White Papers and Best Practice Guides
 - <http://www.sassafras.com/sam/>
- ISO/IEC 19770-3 Software Entitlement Tag standard - Home Page
 - <http://www.samstandards.com/>

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