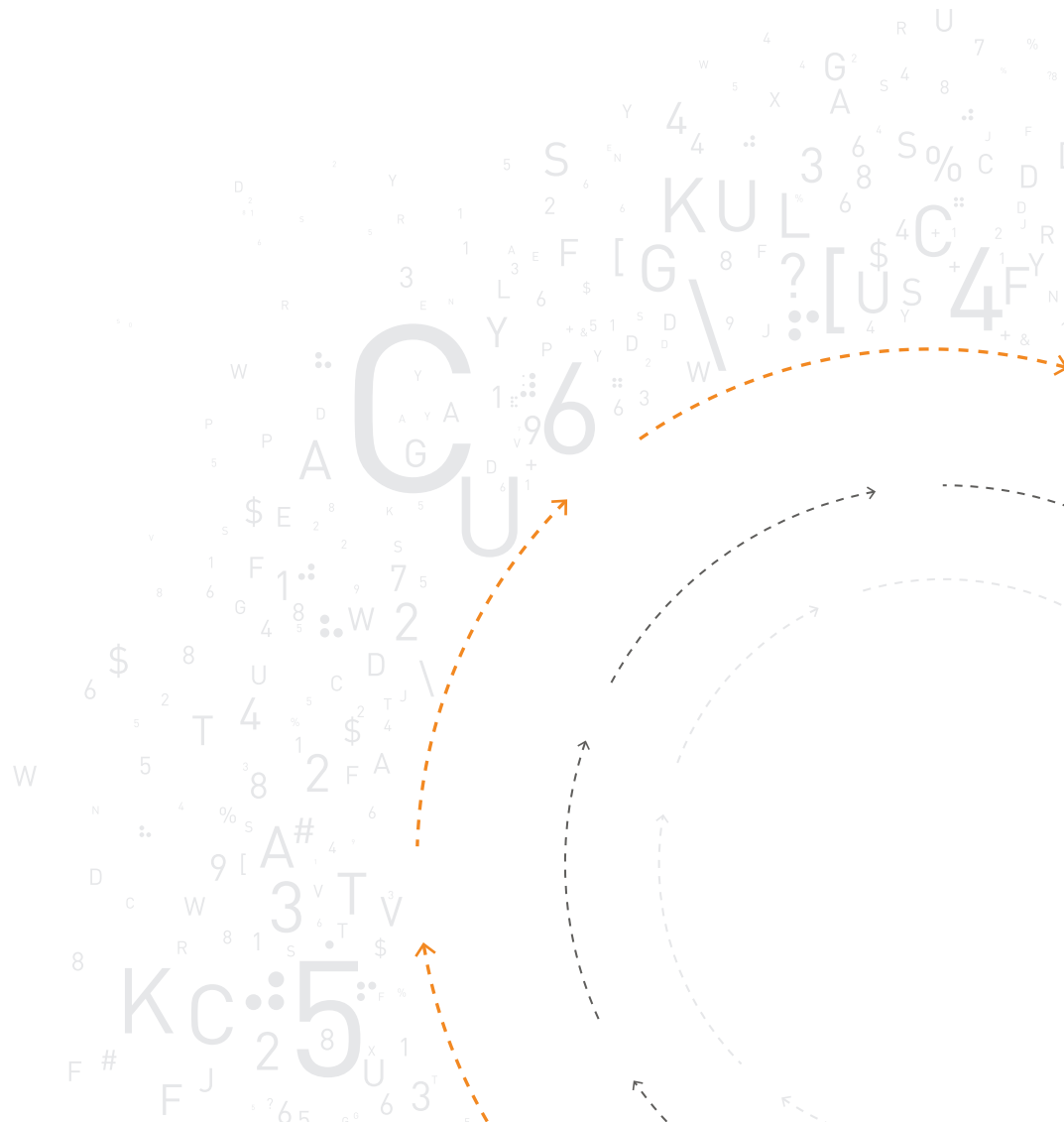




# Sentinel<sup>®</sup>LDK

Out-of-the-box Software Protection, Licensing,  
and Entitlement Management System



# Sentinel Software Monetization Solutions

Sentinel® is the most trusted brand in the software industry for secure, flexible, and future-proof software monetization solutions. The robust portfolio of products and services address each and every aspect of the software monetization lifecycle – from copy and intellectual property (IP) protection to product catalog management and ongoing end-user experience improvement. SafeNet is the first and only vendor to offer a complete portfolio of software licensing and entitlement management solutions to enable monetization of any type of software – installed, embedded, or cloud services – using any combination of business models via any sales channel to any end-user device.

## Software Monetization with Sentinel LDK

Sentinel License Development Kit (LDK) is a comprehensive software monetization solution that pairs the award-winning security, licensing flexibility, and ease-of-use features of the Sentinel license enforcement solutions with the licensing operations management features of **Sentinel Entitlement Management System (EMS)** in one out-of-the-box solution.

### → SOFTWARE COPY AND IP PROTECTION

Maximize profitability by preventing unauthorized use and distribution of software, and by securing competitive IP

### → FLEXIBLE SOFTWARE CATALOG MANAGEMENT

Easily introduce innovative, flexible, and customer-centric offerings into new markets

### → CONSOLIDATE AND AUTOMATE LICENSING OPERATIONS

Eliminate manual operational tasks associated with licensing to save time, minimize errors, and reduce costs

### → END-USER LICENSE MANAGEMENT TOOLS

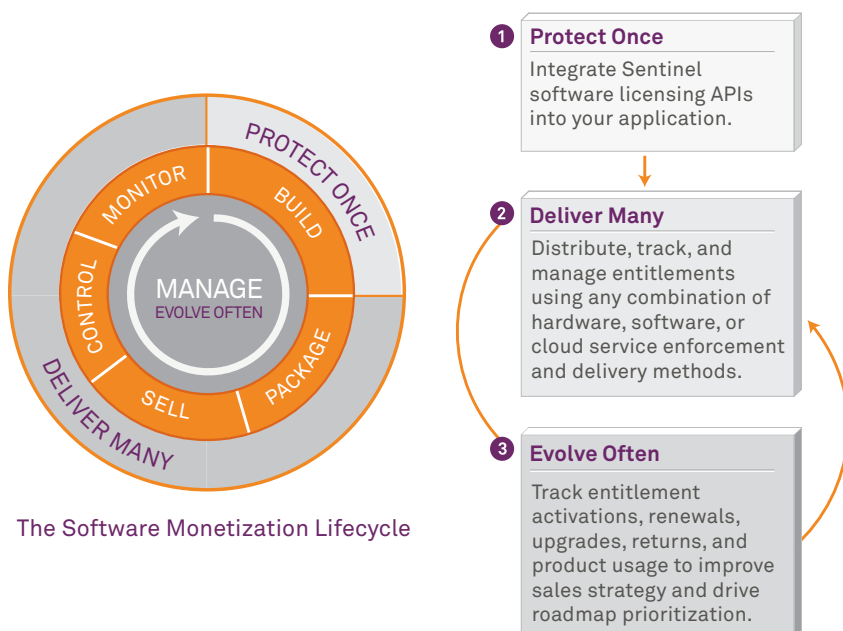
Increase end-user transparency and reduce licensing support costs while improving customer satisfaction

### → DETAILED TRACKING AND REPORTING

Gain insight into how, when, and by whom your software is being activated and used to improve product and business decision-making capabilities

## The Sentinel Design Philosophy

Fully aligned with the entire software monetization lifecycle, the unique **Protect Once, Deliver Many, Evolve Often™** design philosophy of all Sentinel licensing products and services enable software publishers to fully separate their business and engineering processes. Developers integrate, product managers define, fulfillment delivers, and business leaders evolve the offering pricing and packaging strategies on an ongoing basis—all in distinct independent processes. This design feature enables software publishers to maximize product versatility and business agility while ensuring optimum use of employee time and core competencies, resulting in faster time to market and a quicker response to changing market needs.



# Protect-Once-Deliver-Many-Evolve-Often™ enables:

→ **BUSINESS AGILITY**

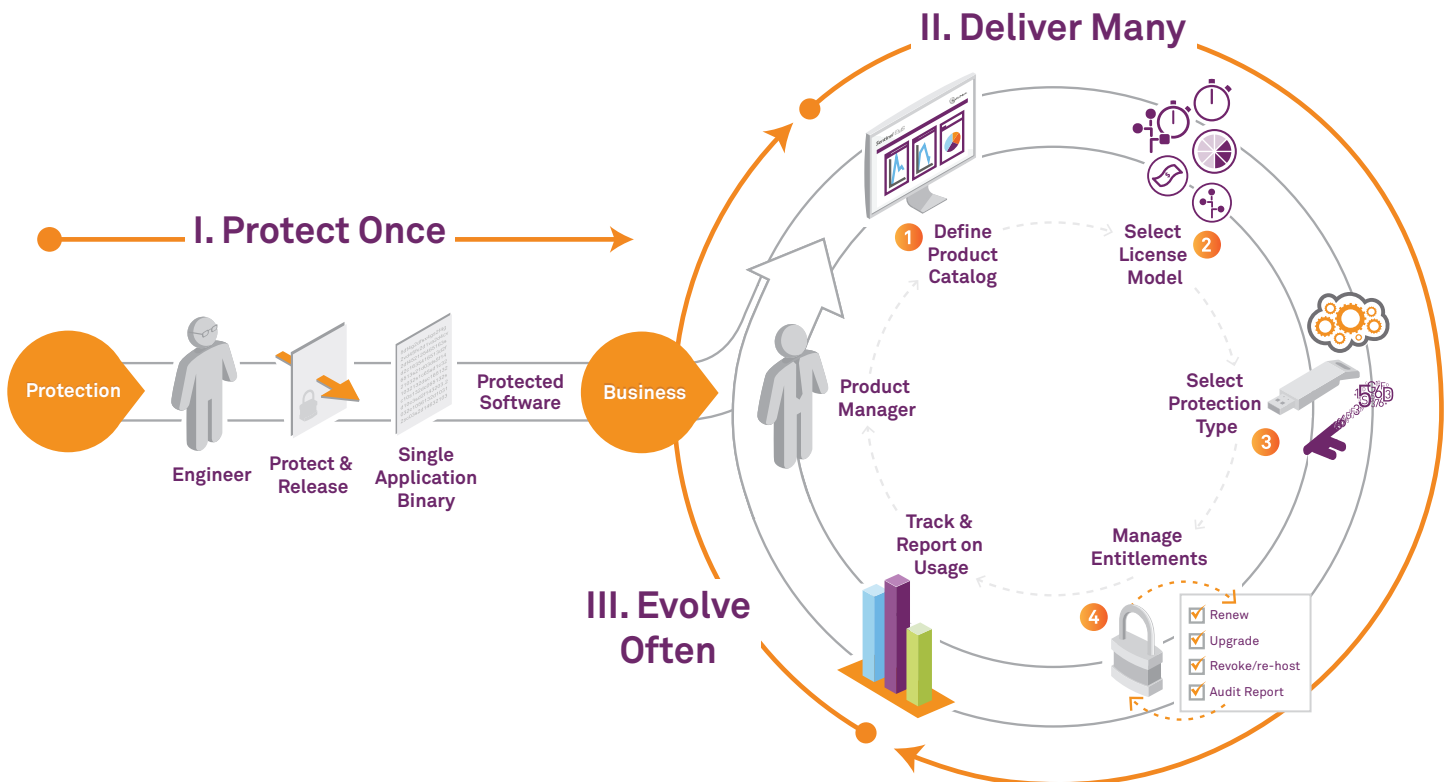
Updated offerings are immediately available, decreasing time to market

→ **REDUCED COST**

Bundling features sold as part of an offering has no impact or distraction on the R&D processes. The R&D team integrates once and requires no implementation changes based on which features are sold

→ **BUSINESS INTELLIGENCE**

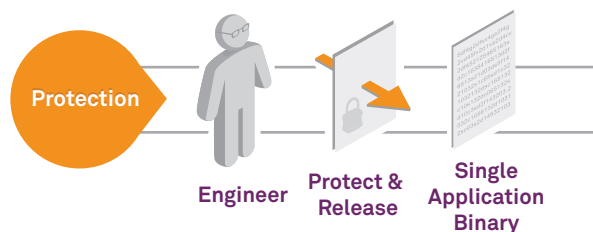
Activation history and feature usage information helps drive business decisions



## How it Works

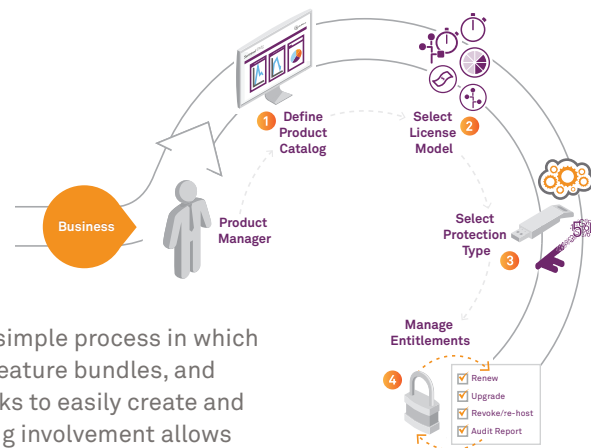
### I. Protect Once – Integrate Licensing APIs

The first step to software monetization is to identify which features of your application you want to license and sell separately, and integrate Sentinel LDK's Licensing API (or Envelope) accordingly. At this stage, you don't need to decide how features will be bundled as part of your offering. Once this step is completed, your software is ready to be sold using any of the various license models.



## II. Deliver Many – Product Bundling and Delivery

Once the protected application is ready for release, your product management team has full flexibility in packaging the offering using various business and licensing models. Once sold, operations fulfill the required product based on the pre-defined distribution model and protection mechanism.



**1 Defining your offering** Sentinel LDK allows for a quick and simple process in which software vendors can create and manage product catalogs, feature bundles, and licensing models on the fly. Having the required building blocks to easily create and maintain a sophisticated product offering without engineering involvement allows software vendors to easily and efficiently bundle their applications in a variety of ways to reach a range of unique market segments.

**2 Choosing a license model** Sentinel LDK provides the industry's widest and most sophisticated licensing models, which can be mixed and matched to meet a variety of market demands.

### Sentinel Licensing Models

- |                                |                    |                  |
|--------------------------------|--------------------|------------------|
| → Perpetual                    | → Pay-Per-Use      | → Volume License |
| → Feature Based                | → Rental           | → Capacity       |
| → Super-Distribution Trialware | → Floating/Network | → User           |
| → Subscription                 | → Commuter         | → Grace          |



**3 Choosing a protection type** Whether you ship physical boxes, embed your software into high-tech devices, offer electronic delivery, or deliver your product as a service in the cloud\*, our various protection types have you covered.

Featuring SafeNet's innovative and unique **Cross-Locking™** technology, Sentinel LDK enables you to leverage any combination of hardware or software license delivery and locking options. Each protection type has its own unique benefits:



**Hardware-based Licensing with Sentinel HL** – Sentinel HL family of keys offers the highest level of copy and IP protection available. Offered in a wide variety of types and form factors, the Sentinel HL keys protect software by allowing access and execution of the application only when the key is physically connected. Sentinel HL keys are ideal for software publishers whose primary concern is security. Ideal for scenarios where the protected application runs on a device that supports USB tokens or an express card.



**Software-based Licensing with Sentinel SL** – Sentinel SL keys are virtual software-based keys built on the Sentinel HL protection technology and residing in the secure storage of your end-user's machine. The use of Sentinel SL eliminates the need to ship a physical product, enabling end users to quickly install and start using the application. Sentinel SL is ideal for software publishers whose end users require more flexible license delivery methods.



For software vendors who would like to offer all or a portion of their offering as a service, SafeNet offers **Sentinel Cloud**, a quick and easy add-on to Sentinel LDK. Integration of the Sentinel Cloud APIs into the software products you wish to offer as a service will provide all of the same product packaging, provisioning, control, and usage measurement benefits enjoyed by Sentinel HL and Sentinel SL customers, and then some. To ensure ease of management, Sentinel Cloud is also fully integrated with Sentinel EMS, the entitlement management component of all Sentinel licensing solutions, including Sentinel LDK.

**4 Managing end-user entitlements** Sentinel EMS, the industry-proven entitlement management engine of Sentinel LDK, enables software publishers and their customers to track the delivery and activation status of end-user entitlements and then easily manage the terms of each entitlement. You can configure the system to notify you or your end-user when trials are coming to an end, when subscriptions are up for renewal, or when a service is not being used. But knowledge is only half the battle, Sentinel LDK also enables remote entitlement activation, renewal, re-host, upgrade, and much more to be performed by either the software publisher or the end-user. The Sentinel EMS component of Sentinel LDK easily integrates into the industry's most common ERP, CRM, Billing, and Marketing Automation systems through a standard Web Services interface. This allows you to easily manage the entire lifecycle of your customer contracts in a fully automated way. This in turn allows for increased efficiency whilst reducing operational costs and providing a scalable licensing platform.



\*As part of Sentinel Cloud Services Add-On

### III. Evolve Often – Adapting Product Catalog

With Sentinel LDK, software publishers have the ability to track when, how, and by whom their software is being consumed. This information can be generated into reports and used to make decisions on how to alter product roadmap, marketing, and packaging strategies. With Sentinel LDK, engineering and business processes are separated. Product management and marketing teams are free to change license models and packaging decisions without ever having to re-engineer a line of code. Knowledge is power, and Sentinel LDK arms software publishers with the information they need to make intelligent decisions, and the ability to easily evolve their business on the fly.



## The Industry's Most Secure Copy Protection Solution

For software publishers delivering physical or electronic copies of their application to end users, the ability to prevent unauthorized use or re-distribution is a critical component to achieving maximum profitability. To ensure that software vendors get paid for every software copy being used, Sentinel LDK employs the industry standard 128-bit AES encryption algorithm. This creates a robust link between the software application and the Sentinel Protection Key—preventing software piracy and ensuring that the only use of the application is authorized.

- **Copy protection with Sentinel HL hardware-based licensing.** License logic embedded in the Sentinel HL keys ensures that licenses are hardware secured and tamper resistant by employing Sentinel LDK's patented **LicenseOnChip™** technology. At runtime, the protected software sends encrypted strings to the Sentinel HL key and, in return, the key decrypts those strings and produces a unique response that cannot be imitated.
- **Copy protection with Sentinel SL software-based licensing.** Sentinel SL is a virtual protection key that is installed and stored on the end-user device. Sentinel SL creates a hardware fingerprint from the end user's hardware to bind the license to the specific device and prevent piracy.

Sentinel LDK also leverages White-Box encryption, ensuring that the communication channel between the protected application and the protection key cannot be replayed, and, therefore, omitted from the overall protection scheme. White-Box cryptography takes into consideration that the potential attacker can trace the protected application and the runtime in search of the encryption key. With this assumption as part of the design, the AES algorithms and encryption keys are replaced with special vendor-specific libraries that implement the same encryption but embed the encryption key as part of the algorithm in a way that ensures it is never present in the memory and cannot be extracted by an attacker.

## Strong Intellectual Property Protection

In an increasingly competitive software industry, the ability to protect your software code from prying eyes, manipulation, and theft is critical to ongoing financial success and competitive positioning. Sentinel LDK offers a secure envelope solution, **Sentinel Envelope**, to ensure software code is safe from exposure while en-route to its end-user destination.

Beyond the encryption algorithm found between the protected application and the Sentinel protection key, Sentinel LDK offers an additional means of wrapping and protecting your application executables and DLL's in a virtually impenetrable protection shield. The Sentinel Envelope is an automatic file wrapper that provides robust Intellectual Property (IP) protection against reverse engineering through file encryption, code obfuscation, and system-level anti-debugging. The Sentinel Envelope creates multiple random layers of protection for each file it protects making it extremely complex and time consuming for hackers to remove.

## Improved End-User Experience

Focusing on an improved end-user experience and transparency, Sentinel LDK introduces the following features:

- **3-Step License Re-host** – Enables end users to transfer an SL key from one computer to another in three simple steps, without the need to contact the ISV and without Internet connectivity.
- **User mode runtime** – Sentinel SL distributed components do not require administrative privileges.
- **Admin API** – Enables ISVs to integrate the end user's administrative license operations into their application, fully customizing the experience.
- **Certificate-based Licensing** – Allows storing a human-readable V2C (license file) stored on the end user's machine for simplified troubleshooting.

# License Lifecycle Management

## Centralized License Management

Sentinel EMS, a component of Sentinel LDK, is a centralized Web-based platform that provides software publishers access to all license and entitlement management functions, a simple interface to their back office systems, and a variety of data collection and reporting tools. Using the Role-based Vendor Portal software publishers can easily create, implement, and manage their product catalog, customers, and end-user entitlements. As the standard entitlement management engine for all Sentinel products and designed for easy integration with any commercial or homegrown license systems, Sentinel EMS provides you with an easy way to centralize all licensing activities company-wide.

## License Fulfillment & Delivery Automation

The automation of licensing and entitlement management functions enables you to minimize manual, time-consuming data entry processes to eliminate errors, while saving time and reducing fulfillment costs. The automation of licensing also has a direct positive effect on customer satisfaction by enabling end users to purchase, activate, renew, upgrade, and re-host without needing to contact your customer support team. Sentinel EMS, a component of Sentinel LDK, easily integrates into the industry's most common ERP, CRM, Billing, and Marketing Automation systems through a standard Web Services interface. In addition, SafeNet offers a variety of professional service packages designed to ease the integration of the Sentinel EMS into any custom homegrown back office system that a software publisher may have deployed.

# Business Intelligence

With Sentinel LDK, software publishers have full visibility into their existing customer base from start to finish. Beginning with the on boarding of a new customer, this centralized platform provides an easy and intuitive automated process for delivering entitlements and registering products while collecting and storing customer demographic, product activation, and feature usage\* information. Once this data is captured, Sentinel LDK enables you to create customized reports around activations, feature popularity and much more. Its automated notification feature also makes it possible to notify on upcoming renewals and updates.

With Sentinel LDK, your organization can plan accordingly for future roadmaps and capitalize on cross-selling opportunities in the following ways:

- **Compliance Reporting** – Providing entitlement tracking and reporting tools that enable end users to easily ensure they are not inadvertently exceeding paid license usage.
- **End-User Insight** – An optional end-user registration step enables you to identify and gain direct access to every individual who activates a copy of the application.
- **Software Packaging Optimization** – Product Management and Engineering can discontinue bloatware and create software packages containing the most popular features that customers and prospects want.
- **Usage Trend Analysis** – Marketing and Sales can utilize customized reports to analyze what, when, and how products are being used, and leverage this invaluable data to plan, launch, and execute more effective sales and marketing activities\*.

# Software Developer Tools

Constantly striving to provide tools to make licensing implementation and management quick and easy for the software publisher, Sentinel LDK offers a variety of software developer tools including, but not limited to, the following:

- **Sentinel Toolbox** - A GUI-based application designed to facilitate developer use of various Sentinel LDK APIs and source code generators. The Sentinel ToolBox allows software developers to execute API functions, observe the behavior of these functions, and then copy the relevant source code into their own application.
- **LicGen API** - A stand-alone licensing interface for sites that already have a licensing infrastructure in place or that prefer implementing an alternative to Sentinel EMS. The LicGen API provides the functionality required to generate and manage Sentinel protection keys.

## Sentinel Cloud Services Add-On

Adding on Sentinel Cloud Services to your Sentinel LDK system provides you with the necessary capabilities to deploy cloud-based services while still taking advantage of the broad set of licensing capabilities that enable service agreement compliance. This empowers you to solve new business problems, enter new markets, and ultimately provide an approach to licensing that aligns with the rapidly evolving end-user experience requirements of today's cloud services trend.

Sentinel Cloud is a cloud-based service that automatically augments your offering with a licensing service layer. To integrate with Sentinel Cloud Services, simply follow the tried and true design methodology to embed basic licensing APIs into your application. Then, during application use, the APIs will interact with Sentinel Cloud to retrieve and authorize your users with their licensing rights delivered in the cloud.

By using Sentinel Cloud to manage your services, the following additional benefits will be realized:

### → REAL-TIME AUTOMATED LICENSING EXPERIENCE

Using Sentinel Cloud allows you to entitle, provision, and update a license to use your services delivered via a cloud license manager. Synchronized with Sentinel EMS, license rights are continuously updated to ensure real-time service agreement compliance

### → NEW WAYS TO DO BUSINESS

Introduce new ways of monetizing your offerings through use-based business models. Support both prepaid (with limits) and postpaid offerings, enabling your customers to pay for what they use. These new models enable a more direct relationship between customer value and the pricing of your offering, while opening up new sales opportunities for customers who might have been previously priced out by your traditional ways of licensing

### → BILLING AUTOMATION

The collection of granular usage information at the feature level is aggregated on a recurring basis and made available via Web services to drive the billing function

### → PRODUCT INTELLIGENCE

Insight into feature-level usage allows a software publisher to know what's hot and what's not by providing visibility into the most popular and least popular features used by customers

### → COMMON ENTITLEMENT MANAGEMENT

Since Sentinel Cloud and Sentinel LDK are both fueled by the Sentinel EMS entitlement management system, software publishers avoid having redundant systems to manage entitlements for on-premise license deployment and cloud-based licenses—further reducing the number of integration points required and significantly simplifying your business operations

## SafeNet Sentinel Software Monetization Solutions

SafeNet has more than 25 years of experience in delivering innovative and reliable software licensing and entitlement management solutions to software and technology vendors worldwide. Easy to integrate and use, innovative, and feature-focused, the company's family of Sentinel® Software Monetization Solutions are designed to meet the unique license enablement, enforcement, and management requirements of any organization, regardless of size, technical requirements, or organizational structure.

For more information on SafeNet's complete portfolio of Software Monetization Solutions for installed, embedded, and cloud applications, or to download a free evaluation of our award-winning products, visit [www.safenet-inc.com/sentinel](http://www.safenet-inc.com/sentinel).

SafeNet is dedicated to the ongoing improvement of our Sentinel Software Monetization solutions; therefore, the list of supported operating systems and development environments is always evolving.

Visit [www.safenet-inc.com/LDKtechspecs](http://www.safenet-inc.com/LDKtechspecs) for the latest technical specifications.




## Join the Conversation

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