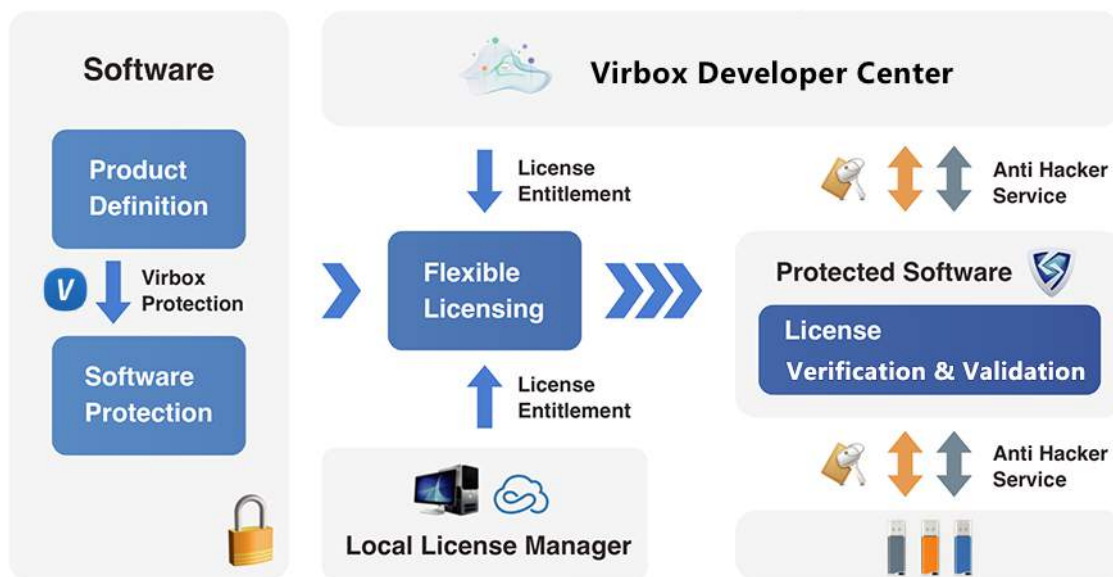VIRBOX
SOFTWARE PROTECTION

SOLUTION OVERVIEW

VIRBOX

Cloud Based Software Protection & License Entitlement Solution: Virbox® LM

Virbox : Universal Solution for software developer to protect Software & IP and provide flexible License entitlement solution to Software vendor for customized Software sales package in different market segment. It provides multi layer protection to software, support license type including dongle, software license and cloud based license with all kinds of license mode.

Virbox® Cloud solution is cloud based License entitlement management system and cloud service provided to software developer (ISV) with Top–Secured encryption technology, lowest TCO, high reliability and easy to use in whole Software life–cycle. License Operation Mode supports: Hardware base license (Virbox EL5 Acme(Dongle)), Software license & Cloud license and are suitable for different software imple– mentation scenario, online, offline, firewall isolated environment, etc. Flexible license option to support ISV software monetization which includes: Perpetual, Trial, Feature on demand, Subscription, Network, Concur–

System Architecture of Virbox®

（ System Architecture of Virbox® LM ）

The one stop solution comprises following component/elements:

Virbox® Developer Center: This is enterprise level cloud based License Entitlement management system, which provides software developer with flexible software licensing, license distribution, license verification and other functionalities for developer in License Entitlement Management, Software Trial and Promotion, License Report and Statistics, Access & Control, etc. Developer can issue license to different license repository: Dongle, Software license, Cloud based license according to different software application scenario. It is not necessary for developer to invest lot of money to deploy on premise license system and would save expenditure both in Capex and Opex in Software Copyright

& IP protection and License Enforcement. Virbox also provides following Toolkits, Service in Software Encryption and dynamic license activation/verification process includes:

Virbox® Protector, the Encryption Wrap(encryption) tool, and SDK which provide rich API and support EXE, DLL, .Net executable applications and following language: ARX, C, C++, Delphi, C#, VB, Java, etc. It protects applications and allows you to protect any existing executable file with multi–secure layer of protection. The protection process involves Compression of the original code, Encryption, Code Fragmentation, Code Obfuscation, Anti–Debug & Anti–Reverse engineering. Virbox Protector supports to encrypt whole application, specific feature,®specific function, And hardware check. Which support to create multiple sales package to meet different market strategy.

Virbox® Developer Utility (Local License Manager)
On–premise License entitlement management tool for flexible license generation & distribution to software user. Support different kind of license mode.

Virbox User License Service, SS:
On–premise Security Service, This is the "User License Tool" installed & runtime service in software user side for License verification & validation, SS also will proactive to detect and prevent hacker to attack on customer premised when application executed. And the developer can retrieve information via SS , then developer can generate report for tracking software usage information for future revenue generation later on.

Virbox® Cloud Service:
Virbox® cloud service provide dynamic update/upgrade Anti–Hacker database to proactive detect hacker behavior in Anti–Debug, Anti– Reverse engineering and use
AES & RSA in communication layer, etc. Each layer will
 be well protected.
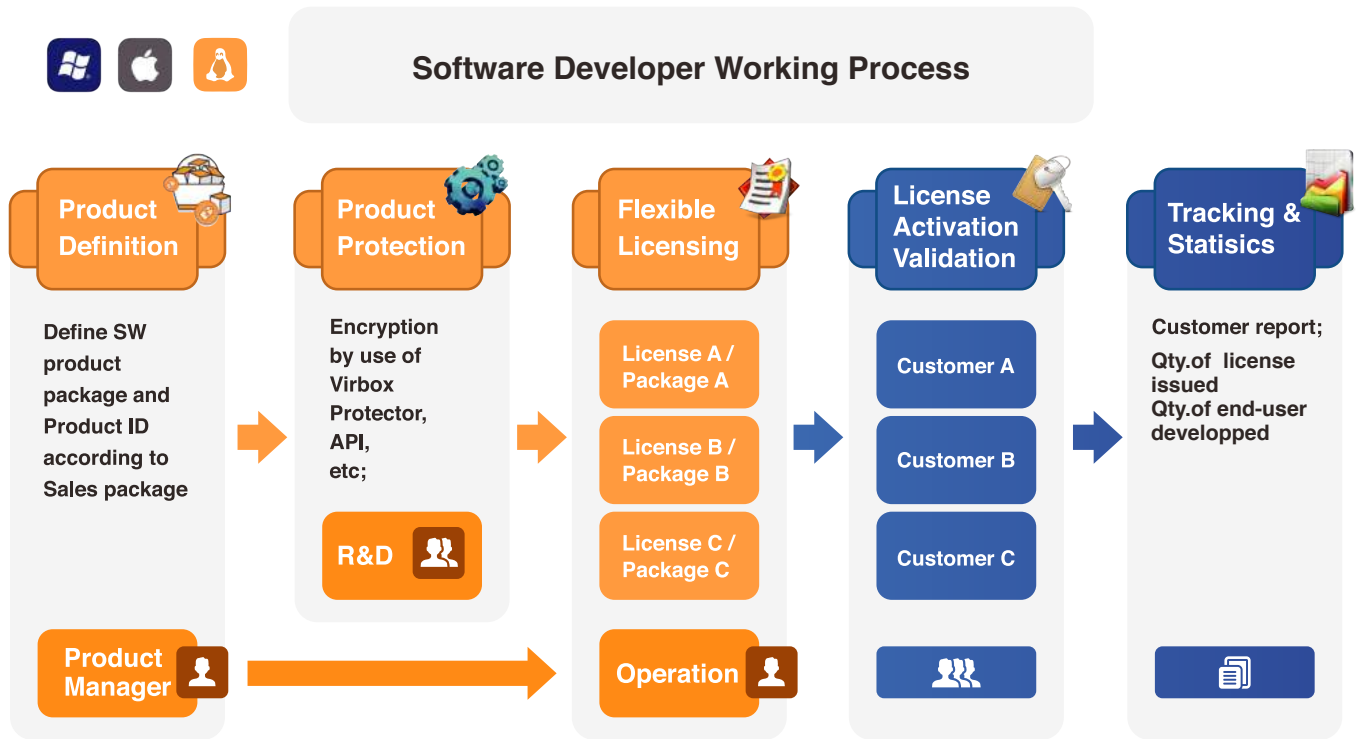
License Operation mode supported by Virbox Cloud platform: hardware based license (Virbox® EL5), software license & cloud based license and suitable for different software implementation scenario, online, offline, firewall isolated, etc.

Virbox® Solution provides License Entitlement & Distribution Service both in web and customer premise to ISV for software protection and license entitlement management, which will save time and investment for Software developer, it is the right time for **ISV** to migrate existed License Solution from traditional protection & licensing system (**HW** investment, Software expenditure) to cloud base system, Virbox® Solution is suitable to be deployed varies from startup company to large scale Software company.

How it works

Software Developer Working Process

Product Definition	Product Protection	Flexible Licensing	License Activation Validation	Tracking & Statisics
Define SW product package and Product ID according to Sales package	Encryption by use of Virbox Protector, API, etc;	License A / Package A	Customer A	Customer report; Qty.of license issued Qty.of end-user developped
	R&D	License B / Package B	Customer B	
		License C / Package C	Customer C	
Product Manager		Operation		

1) Software protection/encryption with Virbox® protector,
2) Define Product template with flexible license type
3) License entitlement management & distribution
4) Software License and software–user statistics
5) Statistics report for No. of software–users and No. of Licenses issued.

Software protection/encryption and License management Solution for ISV with top level **Security** feature, high **Reliability** performance & **Simplified** implementation.

All Effort from Virbox contribute to ISV: from Value Protection to Revenue Generation!

Challenge for ISV :

1.One of myth from software developer is a normal license system could be an effective way to protect their software and license to their valid software–user, but the status of software piracy still show the piracy was continuously to be the most headache issue for developer and also need ISV to seek strong encryption technology to protect their Software and IP.

2. Requirement from traditional Encryption and License system to ISV which focus on to protect Software and IP to build up Software encryption & licensing system on customer premise, include a series of Capex investment, resource invest–ment, which will be heavy load for ISV, especially for new startup company, they have to choose some "light" system for software protection & licensing but it will bring some potential risk from piracy, or tamper to software vendors.

3. The trend of Software market needs ISV to deliver Software with flexible licensing and pricing mode to different customer with low cost and rapidly deployed mode. It will also bring some challenge to ISV to adopt "easy" protection and license system to speed up internal process to meet up fast changing from market.

Generally speaking, it will not be an easy task for ISV to select "Right Solution" to protect their Software and IP or provide flexible licensing system to meet requirement for more and more complicated changeable software sales package, internal operation, license update and related service on demand.

Virbox® Solution: "Make Hard Things Simple"

Virbox® solution supports Software Developer to simplify Software Encryption/protection and License Entitlement Process to: Select & Click.
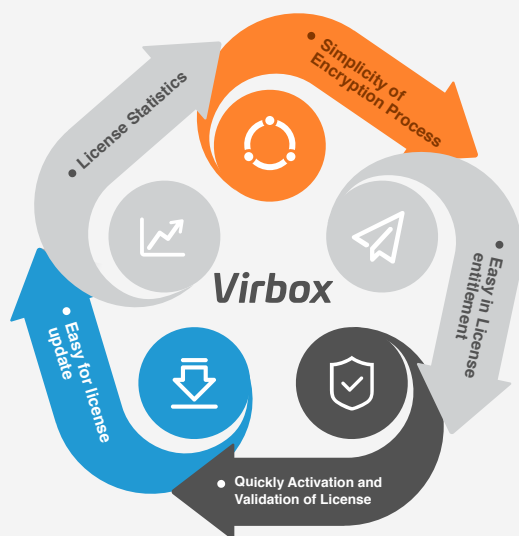
- **Simplicity of Encryption Process**, The huge difference between traditional encryption tools with Virbox® Protector is Virbox® Protector was designed and be used with Auto Encryption process; Devel–oper can select and choose encryption and security level according to each software need to be protected and click relevant button, then all encryption will be executed automatically.

- **Easy in License entitlement**, Developer use web based Virbox® Developer Center or use local license manager (Developer Utility) to issue the license and no need to build up license platform on–premise with heavy Capex; And the system provide multi seat for developer to access the web system, so more person in different role of

software vendor can process the encryption, licensing, license enforcement at same time. And speed up internal operation cycle with low cost and can also save time.

- **Quick Verification and Validation of License**, when developer issue the license to user's account (or dongle), and deliver relevant encrypted software to software user, the rest of license verification and validation will be quite simple process, when user's computer connect to internet and login to their account, they just need to press the refresh button, then the protected software can be executed in user premise. Virbox also support "silent" verification when the software user do not need to pre–verify the license.

- **Easy for license update,** developer can easily update or remove the license issued to software user by updating license information in user account, and user will get license update informa–tion via "refresh" when they connect to internet (or even without take any action when chose "silent" mode). it will improve lot of user experience and avoid traditional license update by send a new license code via email and possible service support involvement.

- **License Statistics,** Developer can get the report generated by Virbox® Developer Center which include the No. of Licenses issued information and No. of software–users information in Virbox Cloud

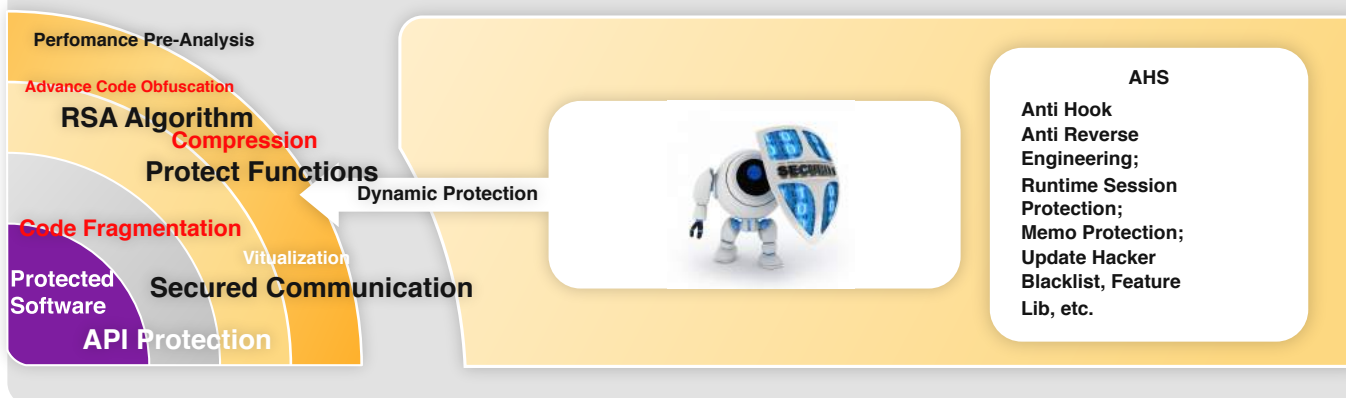# Virbox® Solution: "Make Software Protection with more Security"

How it Encrypts and make the software with more safety and security.

Virbox Protector provides following functionality and technology to software vendors to protect Software and make sure to keep Software Piracy far away from the software to be protected.

- 1. Unique SDK, API and dedicated "Digital Signature Certificate and Private Key", Every Standard Developer Registered in Virbox® Developer Center will have unique SDK, API and dedicated Digital signature certificate for future software protection, encryption/protection the software. Developer can use unique SDK and API to customized specific Software Encryption solution for target software. Each developer keeps different SDK and works with dedicated license entitlement scheme and licensing. So there will no general decryption method and algorithm available for Hacker to all developer who chose Virbox® solution in fundamental layer.
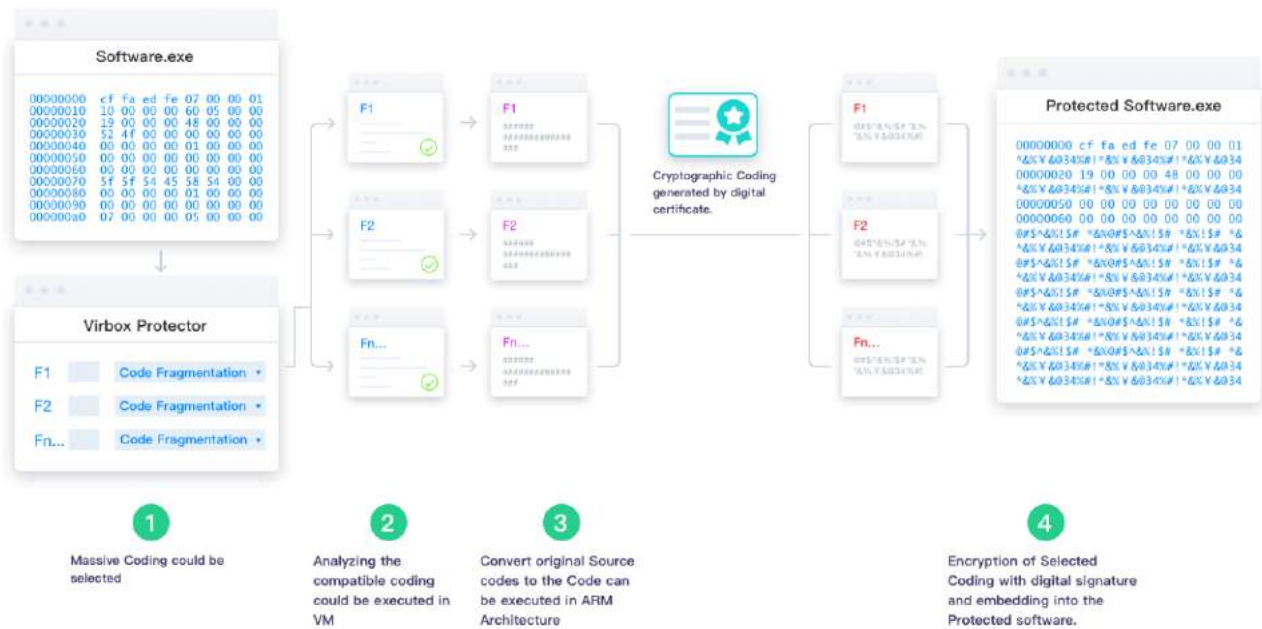
Software Protection

- **Multi Layer Encryption of Software**;
- **Dynamic Anti-Hacker Security System**

Perfomance Pre-Analysis

Advance Code Obfuscation

RSA Algorithm

Compression

Protect Functions

Dynamic Protection

Code Fragmentation

Vitualization

Protected Software

Secured Communication

API Protection

AHS

Anti Hook
Anti Reverse
Engineering;
Runtime Session
Protection;
Memo Protection;
Update Hacker
Blacklist, Feature
Lib, etc.

- 2. Besides of traditional Encryption and Software Wrapping technology such as Software Virtualization, Compressing, Code Obfuscation, One of Key technology for Virbox® Protector to implement in Software Wrap and Protection period is Code Fragmentation of Software. This technology was first developed by Virbox® (SenseShield) and implemented in software protection solution to Software Vendor. Usually, Software developer can select limited part (Only key code can be selected) from software to be protected for code obfuscation, compressing and executed in the security environment, with additional coding work–load. With Virbox® Code Fragmentation technology, Software developer can select and extract huge amounts of coding, IP, functions be protected and pre–analysis performance before protection without extra source coding workload, it extremely save developer effort in Software protection and keep focus on to develop Software features and functionality. And also get top level security to protect IP and Software. It makes it impossible for hackers to take any debug, reverse engineering tools to decrypt those hundreds even to thousands of code running in virtual environment.
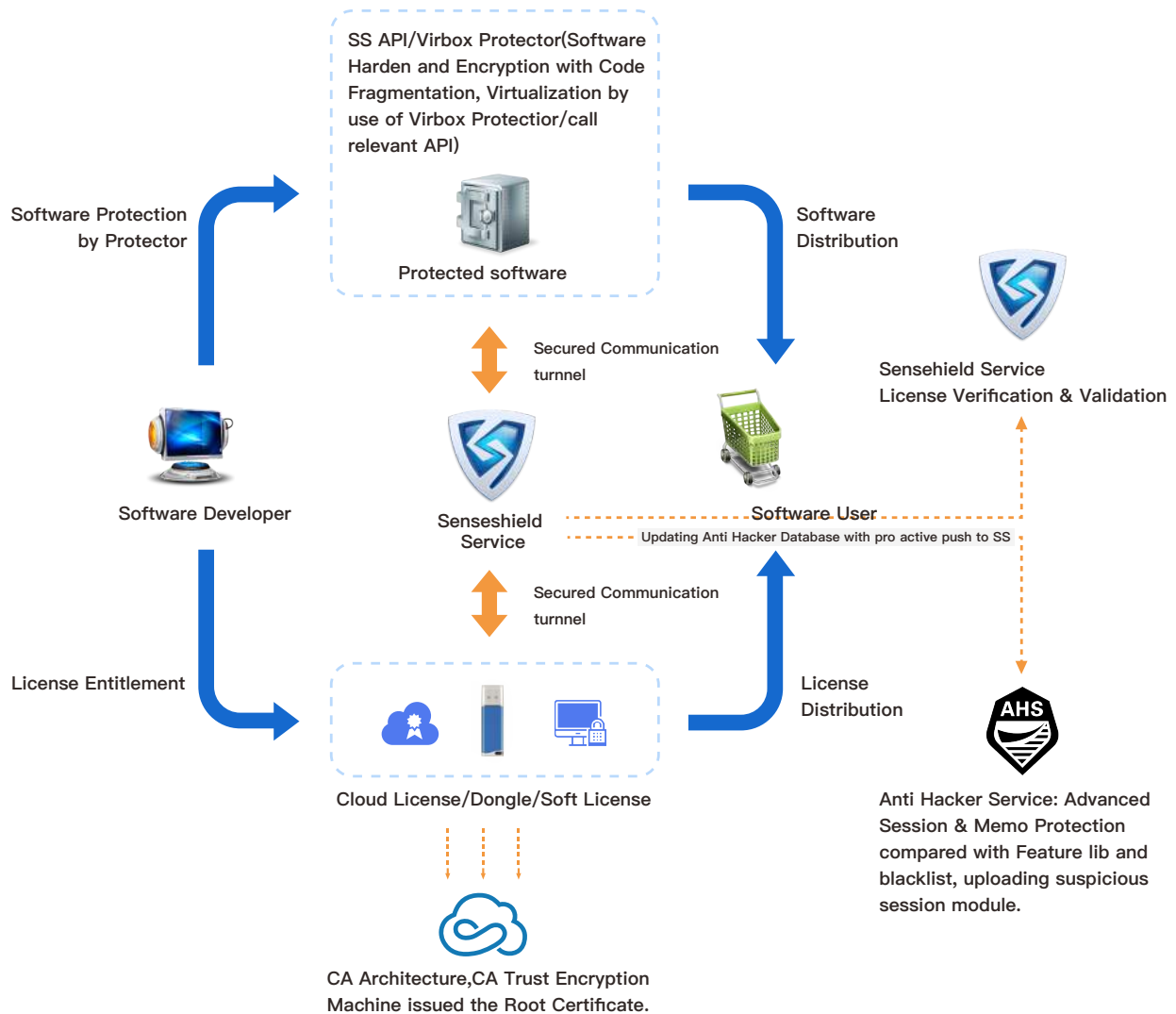
Code Fragmentation Process and Result

- 3. Security Tunnel are also used between Virtual environment and Protected Software, it makes seamless data and code transmission in whole software execution process.

- 4. Dynamic Anti–Hacker Service to Software developer, traditionally Software vendor will get static Software protection no matter what kind of Protection Solution are implemented. Which means, the software only got static protection when software are encrypted and distributed to software user. Besides of Statics Protection, Virbox® Cloud solution also provides Dynamic protection to the software which is distributed to software user by use of Anti–Hacker Service developed by SenseShield. See picture attached: (in next page)

  Key component of AHS is Anti–Hacker Engine which embedded in the Security Service which installed in software user environment. This Engine will proactive to detect any potential hacker attack behavior to decryption, it is runtime tool installed in software user environment with Anti–Debug, Anti–Reverse Engineering, Anti–Hook capability to software. AHS will have latest update Hacker database information from Virbox® LM then software will have both static and dynamic protection after software licensed and distributed to software user.

  So, with Static and Dynamic software protection technology from Virbox® Protector and related Service, Software vendors can focus on to develop Software it self and no additional concern and no need effort spent in software protection any more.

  Virbox® Protector, provides rich open API for internal System integration and support to encrypt EXE, DLL, and .NET in different OS environment, including Windows, MAC and Linux, support following language: C, C++, Delphi, C#, VB, VB, .NET, Java, Python, LUA, etc.

SS API/Virbox Protector(Software Harden and Encryption with Code Fragmentation, Virtualization by use of Virbox Protectior/call relevant API)

Protected software

Software Protection by Protector

Software Distribution

Secured Communication turnnel

Software Developer

Senseshield Service

Software User

Sensehield Service License Verification & Validation

Updating Anti Hacker Database with pro active push to SS

License Entitlement

Secured Communication turnnel

License Distribution

Cloud License/Dongle/Soft License

AHS

Anti Hacker Service: Advanced Session & Memo Protection compared with Feature lib and blacklist, uploading suspicious session module.

CA Architecture,CA Trust Encryption Machine issued the Root Certificate.

Virbox® Solution: "High Availability and Reliability"

Virbox® Cloud platform built up with redundancy and high availability Philosophy, Software developer, no matter for new startup ISV, SME, and large scalable software enterprise can choose Virbox® solution to build up dedicated software Protection and Licensing solution with lowest Total Cost Ownership, the platform allows the employee with different role in Software vendors with different authorization to access the platform for Software encryption, tailor made product template and Software Sales package, flexible licensing, distribution and update license without additional service involved. Software vendor can use Virbox® Protector and Select Wrap and Protection level to encrypt software, and either to use Virbox® Cloud Platform or use the offline tools: Developer Utility for flexible licensing their software product to different repository: Dongle based, Cloud based or soft based license. With all kinds of license mode.

Reliability and Availability: The principle to buildup Virbox® Developer Center includes every network element: all Server, Encryption Equipment in Financial Level, Digital Certificate system, will effectively prevent both from Private key leakage internal and hacker attack, invasion outside. The Architecture of cloud platform has been designed for redundancy and distributed in different geographic area and site with load balancing architecture to support highly workload transaction, license Entitlement, Validation and Verification between cloud platform and verification user premise with 99.9% avail–ability and 7X 24 hours access capability for software vendor's daily operation.
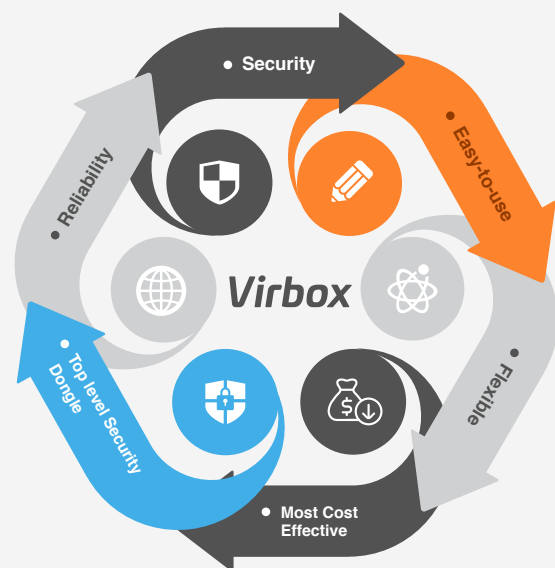
Solution Advantage

- Top level of **Security** to protect Software with technology based more than 100 patents owned by SenseShield include VM shells, Virbox® encrypted compiling engine, code fragmentation technology which make your software be protected with more safety & high reliability. It also provide dynamic Security guarantee to Software by Anti Hacker Service which integrated in the SS (Security Service)

- **Easy–to–use.** Virbox® Protector, the software encryption Wrap toolkits provides the feature for Performance pre–analyzing and auto–optimizing with functionality of "Select and Click" which makes developer can protect their software even without any programming knowledge. Developer can create customized protection package via select key Software component, such as functional module, key part of coding, etc. No source code modification required.

- **Flexible** Licensing and entitlement management, Virbox provide flexible license/sales mode: perpet–ual based, trial based, feature based, time based, subscription based, usage based, floating based, networks, all different kind of license mode could be used and suitable for ISV to package the Software and license it with different pricing mode to meet market requirement. Protection in advance, licensing with flexible mode later on; License supports hardware based License, cloud based License, software License, etc.

- **Most Cost Effective** solution for software develop–er in Total Cost Ownership: Virbox® decrease lot of Software developer cost and effort in Software protection, Licensing, and Version management & maintenance and related service. The software can be fast deployed by different market segment and support developer to maximize revenue in whole software lifecycle.

- **Top level Security Dongle**, Virbox® EL5 is the latest version & future–proofed of smart dongle designed for Software protection and licensing, it works with the Virbox® LM to provide top level security guarantee to Software. Virbox® EL5 Acme integrated with top latest 32 bits ARM smart chipset and security level up to CC EAL5+ with execution speed up to 50MIPS, it contains secured RAM and flash memory which makes software dynamic be encrypted in different level. Please find more detail technical feature for Virbox® EL5 in the datasheet separately.

- High **Reliability** with 99.9% level cloud platform; 7X24 availability. Deployed Environment for the software user includes open internet environment, limited internet access environment and offline environment, such as military, government and industrial environment;

With Virbox® cloud based license platform, SenseShield leverage the Virbox® Protector, Unique SDK with top security level protection technology, SS, Security Service on customer premise, and the Virbox® cloud database & Service with Anti–Hacker Service and updated Hacker database, Anti–Debug, Anti–Reverse engineering capability to make sure ALL Software be well protected licensed, distributed to software user.

Benefit and Value

- Reliable & Future–proofed platform (99.9% reliability) to support ISV migration to SaaS & enhance business agility.
- Dynamic Software protection and License entitlement solution to protect Software Value & Create Revenue;
- Fast Deployment and integration with software vendors back office system;
- Easy to use & one stop solution support ISV to focus on Software development and revenue generation
- Save investment to Traditional License system in hardware on premise, Service in implementation & integration period.
- Best experience for both Software vendor and software user.

Features

Virbox® LM fully support following license scenario with flexible mode,
Cloud license: compatible with hardware based license, suitable used in open internet access environment; license entitlement and update/upgrade without manual intervention.
Soft license: independ HW, used in offline environment, easy for license enforcement with low cost to be deployed;
Hardware base license (Dongle): State of art hardware and license key with best performance in hardware & high security mode, could be used in stand–alone environment or be used online with Virbox® Cloud platform with more advanced functionality activated.

Deployed Environment for the user in open internet environment, limited internet access environment and offline environment, such as military, government and industrial environment;

Operation System supported : Windows, Linux, Mac.

Programming Language supported: C, C++, .Net, Java, Delphi, etc.

Encryption mode supported: Call API Protection and Auto Encryption in Developer selective Encryption Level (by Virbox Protector)：

Compression, Name and Code Obfuscation, Code Fragmentation, Protect specific function; or developer can combine use the "Call API protection" and Virbox Protector to reach top security level for Software copyright and IP protection.

API: Rich API interface available for Developer:

- Runtime API: is a group of API reserved for developer to verify related license kept in the repository by calling these A PI from software. Run–time API are most frequently used API for developer.
- D2c API: reserved for developer which they can use to issue the license to hardware lock in Virbox Developer Center. Also provides developer to issue license with more flexible way.
- Control API: was designed for developer to validate/inquiry the license content, status of license file are stored in the repository;
- Open API: Virbox provides Open API toolkits for developer for internal system integration with CRM or ERP, developer can use Open API to issue licenses via developer's internal operation system .
- App Wrapped: exe, DLL, etc.

License Mode:

Perpetual, Network and Concurrent, Time based & subscription, Feature on demand, Usage based, Node Locked, Clock dongle, Floating, etc

Customer & Partner

Virbox® solution are widely deployed in Architecture, CAD, GPS/GIS, Gaming, Automatic and embedding equipment, POS, Medical, Video surveillance industry in China and worldwide.

Typical application scenario:

- **Construction Industry:**
  Virbox Protector, The Outstanding Software Wrapping tools, will dramatically reduce the risk of software cracking and piracy, improve the SW developer Operation efficiency and reduce the cost of software protection, With the Flexible licensing mode provided by Virbox Solution, the Software developer is able to package their software products in different sales package with different product portfolio and it will help developers to promote the software products in different market segment with flexible price scenario.

- **CAD software Protection:**
  Virbox Protector was specially designed for CAD software for the ARX protection to ensure that the relevant libs, functions and code not be cracked and being Anti–Debuged. Large storage space of Virbox EL5 (dongle) allows CAD software Develop–er to issue licenses with various software modules. Select the Virbox EL5 dongle, the excellent software
  protection dongle, you will get the total solution to protect your CAD software with state of Art technology and future–proofed solution for your business.

-
  GPS / GIS
  Besides of High Security SW protection to GPS and GIS software by Virbox Solution, Key advantage for Virbox License Solution provide to GPS/GIS Software Developer are Network Licensing, Soft License mode to GPS/GIS potential customer, these License mode will help developer

to sell SW to the military and other sensitive departments better.
With subscription License Mode, GPS/GIS Software developer has capability to sell SW to some customer with time limitation and get more sales opportunities from the customer without afford expensive charge for perpetual licenses.

- **Gaming Industry.**
  With Combination of Code Fragmentation and Manually called dedicated API functions, The Game Software developer will get high Security to protect Game Software.
  With variety of Security technology, such as Security Service Architecture, Anti–Hacker Engine, It provides continuously dynamic protection to Game Software.
  With Low time latency (less 10ms) of License validation, Unity 3D developer Engine and other feature for Game Developer and software–user, it will provide best experience for both Game Software developer and software user.

- **Industrial Automation**
  Virbox Solution, EL5, Soft License, are widely used in Industrial Automation area, includes Software protection in embedding system in different industry, Hardware expansion via license expansion, Software Upgrade by License update etc.

Patents & Certificates

- Patents Issued: 107
- US Patents Issued: 2
- Waiting for final approval: 166

- National Certificate of Software Copyright
- National Certificate of Software Registration
- Award by State Intellectual Property Office of PRC.

VIRBOX EL5   CLOUD LICENSE   SOFT LICENSE

ISO C E FC RoHS REACH SVHC ♻

More about SenseShield

SenseShield has more than 20 years experience to develop the solution for Software Copyright & IP protection, with more than 9000 customer in worldwide and about 20 Millions pcs of dongle delivered to customer, 2 Millions Cloud licenses/Security Service installed in customer premised (by year end of 2017)

Most Security Software Copyright Protection with Flexible Licensing solution, that is Virbox® Solution.

Bring Best Customer experience to Software Vendor and end user.

Contact information

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🏢 **Beijing Senseshield Technology Co.,Ltd.**

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SOFTWARE PROTECTION