



CryptoGuard

– Protect your content –



Pay-TV Content Protection

Conditional Access &
Subscriber Management System
Card based & Cardless Solution





Excellence in Content Protection - Since 2007

About CryptoGuard

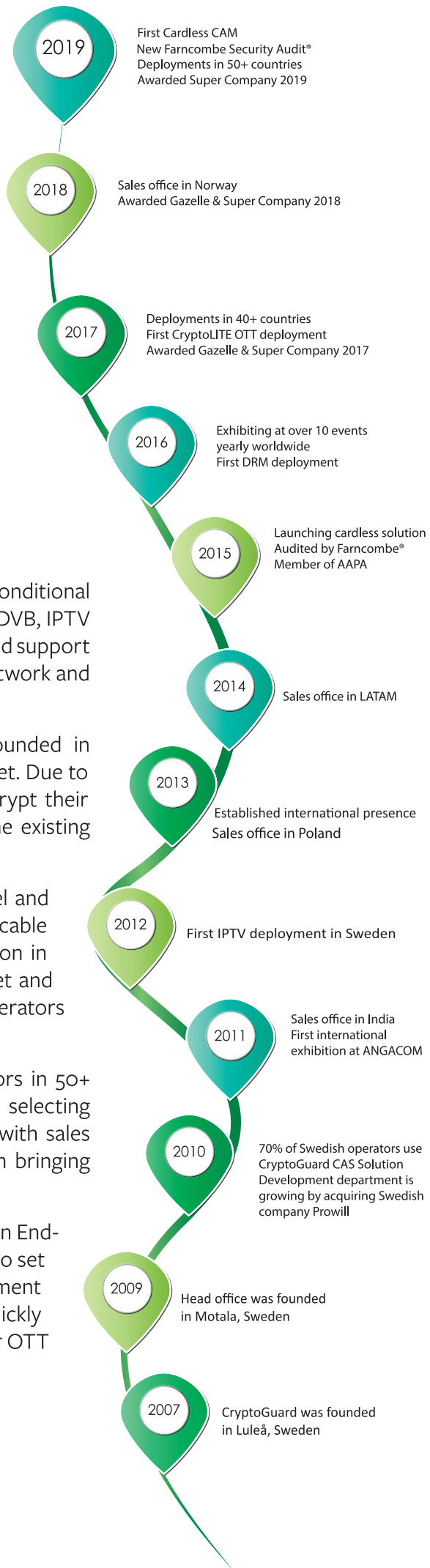
CryptoGuard is a global provider of Pay-TV content protection such as Conditional Access (CAS) and Digital Rights Management (DRM) for any platform DVB, IPTV and OTT. CryptoGuard's solutions are flexible, scalable, cost-effective and support an attractive 'pay-as-you-grow' business model, ideal for any size of network and operator.

The successful journey began in 2007 when CryptoGuard was founded in Sweden and launched its CAS, tailored for the Swedish Cable-TV market. Due to the analogue switch-off, regulations required cable operators to encrypt their content and numerous small operators faced serious concerns as the existing CAS alternatives were very expensive.

CryptoGuard CAS proved to have the right pricing, high security level and scalability for any size of network which resulted in 70% of Swedish cable operators using CryptoGuard CAS in 2010. The successful introduction in Sweden led to CryptoGuard's expansion into the international market and continued product development to meet the demands from major operators and broadcasters worldwide.

Today the company's solutions have been deployed by 250+ operators in 50+ countries worldwide, with a number of national TV broadcasters selecting CryptoGuard as its security partner. CryptoGuard is well positioned with sales offices on three continents and with an extensive partner ecosystem bringing world-class solutions to the market.

In recent years, CryptoGuard has expanded its product portfolio with an End-to-End OTT solution CryptoLITE™ which includes everything needed to set up an OTT service – processing and distribution of streams, management system, DRM content protection and user's apps. The cost-effective, quickly installed and scalable system enables operators of all sizes to start their OTT services, even with low number of users.





Turn-key CAS & SMS Solution

Choosing the right Conditional Access System (CAS) is essential to ensure that only paying subscribers are getting access to the content and to be able to get premium content from content providers. CryptoGuard CAS utilizes advanced security and is constantly improved with the latest innovations in encryption, software obfuscation and hardening security. CryptoGuard are also actively fighting piracy through the Audiovisual - Anti Piracy Alliance (AAPA).

CryptoGuard CAS is ideal for any size of operator and can scale up to millions of subscribers. It supports any business model and facilitates DRM and OTT for anywhere, -any device viewing experience.

Advanced Security

CryptoGuard CAS is utilizing security modules on the head end side, with the most secure hardware. On the STB and CAM side, CryptoGuard CAS has always used secure pairing with link protection to avoid control word sharing. CryptoGuard CAS is utilizing advanced security embedded in DVB chipsets from the major chipset vendors for both Cardless and Smartcard based solutions. In addition to storing secrets in highly secure chipsets, software obfuscation and the strongest encryption technology is used to avoid device cloning, control word sharing or any other piracy threats.

CryptoGuard Smartcards always use the most secure chips available on the market. These chips are state-of-the-art EAL5+ certified and rigorously tested.

Built-in Subscriber Management System (SMS)

CryptoGuard CAS includes an SMS that allows operators to handle subscribers, smartcards, ordering, customer care etc. The SMS, based on a MySQL database and Linux, has an open architecture with a full set of APIs available for integration with third party systems, such as business applications, billing, CRM, data-mining, OTT system etc.

FARNCOMBE SECURITY AUDIT®	
Company	CRYPTOGUARD
Product	CRYPTOGUARD CAS
Date	JULY 2019

Cartesian, Inc.

CryptoGuard CAS has completed Farncombe Security Audit® trusted by Hollywood studios



State of the art CC EAL5+ certified smartcard chips



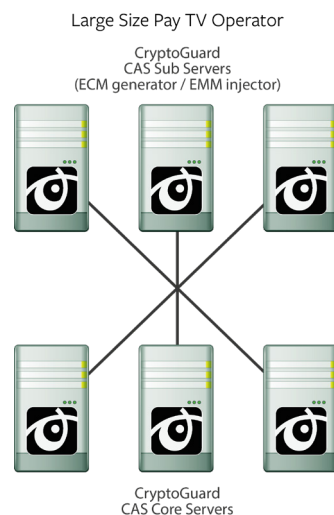


Proven High Availability and Scalability

CryptoGuard is using MariaDB (earlier MySQL) to store all information and configuration. MariaDB is a well-known and well-proven open source enterprise database used by many large companies all over the world.

There is one master database in the CryptoGuard CAS Core Server. From the master database, data is replicated out to smaller MariaDB databases in CryptoGuard Sub Servers. Sub servers can be EMM Injectors, ECM Generators, DRM Key servers etc. With this concept, it is possible to add several CryptoGuard Sub Servers to achieve the needed performance. The Pay TV Operator can for example have two or more ECM Generators with automatic fail-over from one ECM Generator to the other.

The only database that needs to be backed up is the master database in the CryptoGuard CAS Core Server. The master database in the CryptoGuard CAS Core Server can be established on two or more servers to enable any level of redundancy. By using a Galera Cluster, a fully automatic fail-over clustering system can be established where database servers can be automatic included and excluded. By adding more CryptoGuard CAS Core Servers and CryptoGuard Sub Servers CryptoGuard CAS can scale up to millions of subscribers.



CryptoGuard CAS - Scalable for Any Size of Operator

CryptoGuard CAS is highly scalable for any size of operators. For a small operator, CryptoGuard CAS can run all applications on one single server. CryptoGuard CAS can run inside the multiplexer, on a separate server.

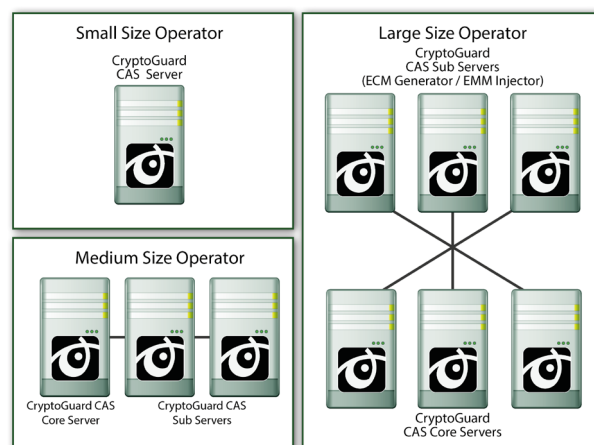
For a medium size operator, the Pay TV Operator can have separate servers for CryptoGuard CAS Core and CryptoGuard Sub Server. This configuration not only supports a larger number of subscribers, but also provides redundancy for the CryptoGuard Sub Server.

For larger Pay TV Operators, several servers are needed. This also makes it possible to establish a full redundancy for all parts of the system.

Multi Network and Multi Operator Support

CryptoGuard CAS can be configured to support any topology of network. One central CryptoGuard CAS Core Server can control many ECM Generators and EMM Injectors that are placed in different locations. Thereby, cable networks in different locations or different satellite uplinks can be centrally operated as one system from one CryptoGuard CAS Core Server.

CryptoGuard CAS is one of the most flexible CAS hosting systems in the market today. One CryptoGuard CAS Server can be partitioned so that a large number of independent Pay TV operators can be operated from one central system.



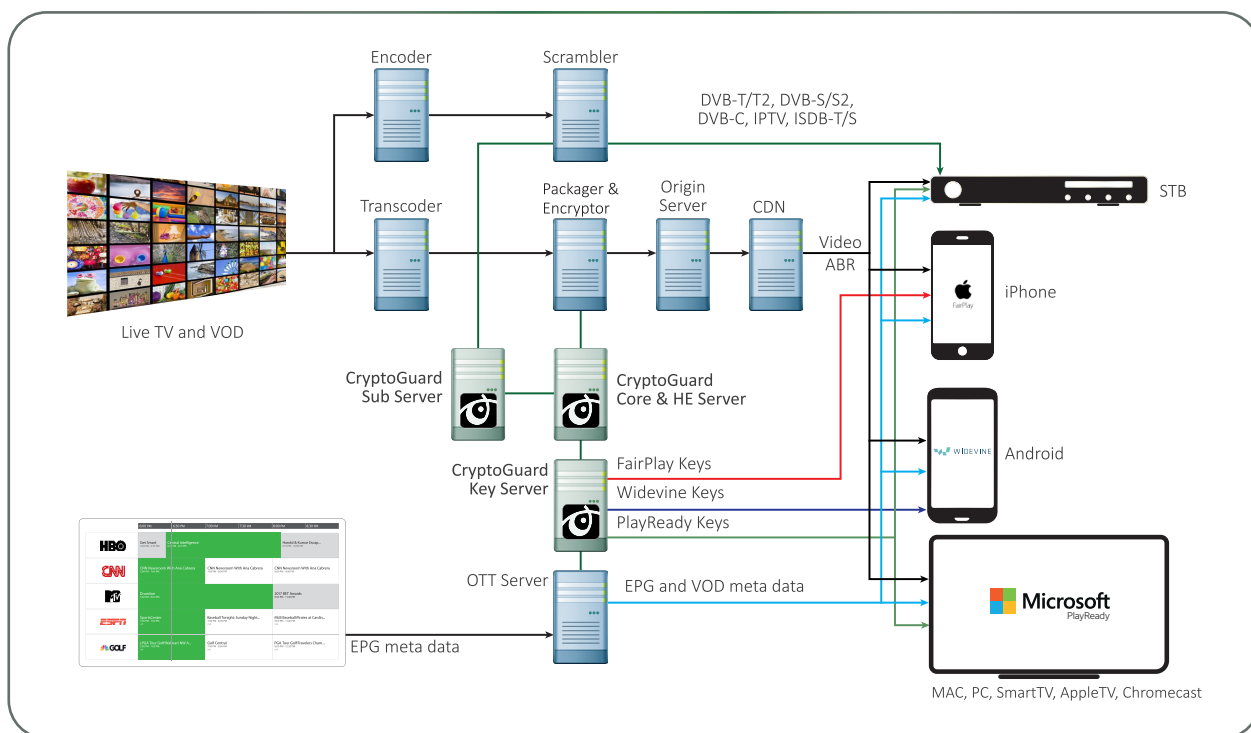


Each operator has full freedom to configure content, packages and subscribers. Each Pay TV operator can have an IP connection from their scrambler to the hosting operator or they can have CryptoGuard Sub Servers at their premises. By selecting a hosted solution, smaller Pay TV Operators will be able to operate their own network without the need of skilled technical employees.

CryptoGuard CAS/DRM - Combined DVB and OTT Services

CryptoGuard CAS can be extended with the CryptoGuard DRM solution where the Pay TV operator can manage content and subscribers from one system. The DRM supports Apple-Fairplay, Google-Widevine and Microsoft-PlayReady. STB vendors usually embed PlayReady or Widevine. For more information, please see the CryptoGuard DRM brochure.

CryptoGuard CAS can also be extended with the cost-effective End-to-End OTT Solution CryptoLITE™ - containing OTT Server, Transcoder, Origin Server, CDN Servers and apps for iOS and Android. For more information, please see the CryptoLITE™ OTT brochure.



CryptoGuard CAS - Best in Class for Contribution

CryptoGuard offers professional CAMs that support 25 channels in one CAM. This dramatically reduces the cost when establishing contribution networks. Professional CAMs are available in 4, 8, 16 and 25 channel versions.

Technical Specification

Number of supported subscribers	Any size from a few hundred to millions (Unlimited)
Supported Business Models	Subscription, Pay Per View and Events
Supported Transmission	DVB-C, DVB-T/T2, DVB-S/S2, IPTV, ISDB-T/S
Multi Network Support	One CryptoGuard CAS Server can support many sub servers
Multi Operator Support	One CryptoGuard CAS Server can serve many operators
Simulcrypt version	ETSI TS 103 197 V 1.2.1 and V 1.3.1 (Simulcrypt 2 and 3)
Subscriber managing system, SMS	A SMS to control subscribers in the CryptoGuard CAS system is included
API for 3rd party billing / SMS	Yes
Cardless and Smart Card control	Customer, network owner, program supplier
Subscription sales	Customer service, subscriber log-in with PIN code, prepaid activation codes, retailer login
PPV and VOD	Yes
DRM	Yes, supported through CryptoGuard DRM
Multi DRM support	Microsoft PlayReady, Widevine MPEG Dash and Apple Fairplay supported.
Activation technology	Tags and program numbers. Last expiry date, positive control and negative control.
Database and redundancy	MariaDB (Earlier MySQL) supports master slave and Galera cluster
Administrator privileges	System access can be defined per user and customized roles can be created
PSI/SI-play out	NIT, SDT, SDT actual/other, CAT, TDT, TOT, Private Sections
Supported Servers	Intel 64 bit, 8G Ram and 400G of disk Various Head Ends and Raspberry Pi for small nets
CAM Support	Consumer CAMS for both CI and CI+ Professional CAMs for 4, 8, 16 or 25 channels
Pairing	Yes, on both Standard and Advanced Security Controlled at channel level
Control word sharing protection	Yes, on both Standard and Advanced Security
Number of channels/ channel package/MUX	Unlimited, defined on order. Standard is 512 tags. Several channels can have the same tag.
Supported STBs	A separate list of tested STBs is available
Over the Air upgrade of STBs	Yes, supported for both STB middleware and the CryptoGuard Cardless CAS client
Update/new releases	All operators paying for SLA will continuously get server upgrades
Text messages to users	Messages up to 2048 characters
Fingerprinting	Group, individual, set position and moving position
Forced tuning	Yes
Reports	Standard and custom reports
Quick installation	Yes, through kick starter
OTT	Yes, CryptoLITE supports full end to end OTT solution

CryptoGuard CAS Features



Access Criteria

Large variety of channel packages for both card based (512) and cardless (1024).



Advanced Security

Only trusted code can be executed on the STB.



API

The CryptoGuard SMS is based on a MySQL database and Linux. The architecture is open and there is a full set of APIs available for integration with third party systems, such as business applications, billing, CRM, data-mining, OTT system etc.



Economy

Exports invoice rows from CryptoGuard's SMS system to your own billing system. A customized solution can be made according to your requirements.



ECM & EMM Redundancy

Additional ECM & EMM servers can be installed working redundant to each other, meaning if scrambler loses connection with main ECM server, it automatically connects to the spare server and vice versa.



EPG

EPG The CryptoGuard EPG server is divided in two parts, one server that is installed with the CAS and SMS and one central database that collects and distributes the EPG information to EPG customers.



EMM/ECM Fingerprinting

Card number and/or IRD number can be displayed on the screen, on chosen services, to be able to track recorded copyrighted material.



Force Tuning

Forces the STB to tune to a specific service at a specific time.



OTA

Upgrades the software of your STB's and CA modules Over-The-Air.



Messaging

Send long messages, up to 2048 characters, to a STB. It is possible to schedule when they are sent, choose to which service, force their appearance and set the duration of the message.



Parental lock

Enables PIN code control.



Pairing

Functionality to preventing card sharing.



Pay Per View Event

Purchase a pay-per-view event.



PSI/SI Inserter

PSI / SI inserter describes to the recipients how the network is constituted. CryptoGuard CAS can hereby configure channel lists, frequency tables and the program guide. Data is generated to recipients such as NIT, SDT, SDT other, TDT, TOT and EIT tables.



Report

Reports current and historical statistics of activations, subscriptions, customers, channels and other parts of the system. It is also simple to ad custom made reports.



SMS included

Subscriber Management System is included in the CAS.



Subserver

When your network extends over a larger geographic area with different frequency tables or if you have several head ends, it can be necessary to separate components from the main server. An example is an additional PSI/SI server or ECM generator.

Words from our customers

Ready TV | Jamaica

We chose to go with CryptoGuard due to the company's unparalleled performance and scalability (supporting both cardless and card-based solutions simultaneously). As a television service provider, you have to be certain that only paying customers are able to view your TV-channels and content.

CryptoGuard uses a high-grade encryption scheme that can be used for satellite TV, cable TV, terrestrial TV and IPTV. The CryptoGuard services can easily evolve to support Multi-DRM solutions for protecting content on mobile devices, tablets, PC/MAC and Smart TVs in the CryptoLITE™ end-to-end OTT Solution.

Chris Dehring, CEO of ReadyTV

Kopernikus | Serbia

Kopernikus chose CryptoGuard's CAS system because of the good conditions, high quality, flexibility, user friendly customer interface regarding work on the system and complete integration of all needed functionalities.

Stevan Mićašević, CTO in Kopernikus

Digiana | India

CryptoGuard CAS is one of the most reliable and stable CA Systems. Also providing high quality product and user-friendly interface. This is why CryptoGuard has been our first choice for secured CA System.

Sukhdev Singh, Managing Director Digiana

Sappa | Sweden

The deciding factor for choosing CryptoGuard was the low entry costs and ready to use SMS. CryptoGuard is a stable, future-proof and well-functioning system, but still flexible enough to give us many opportunities for customization.

The company consists of competent staff with high sense of service that are always quick to give feedback and to solve any problems that might occur.

Hasse Svensson, CEO Sappa

Radijus Vektor | Serbia

Radijus Vektor has chosen CryptoGuard CA system because of cost-effective business model which is based on affordable TCO. We can use CryptoGuard CAS for any Pay TV service, e.g. DVB-C and IPTV - single encryption server for many kinds of encrypted services. Wide range of STB and CAM module Partners give us flexibility to choose the best CPE for us. Final reason is good and fast support.

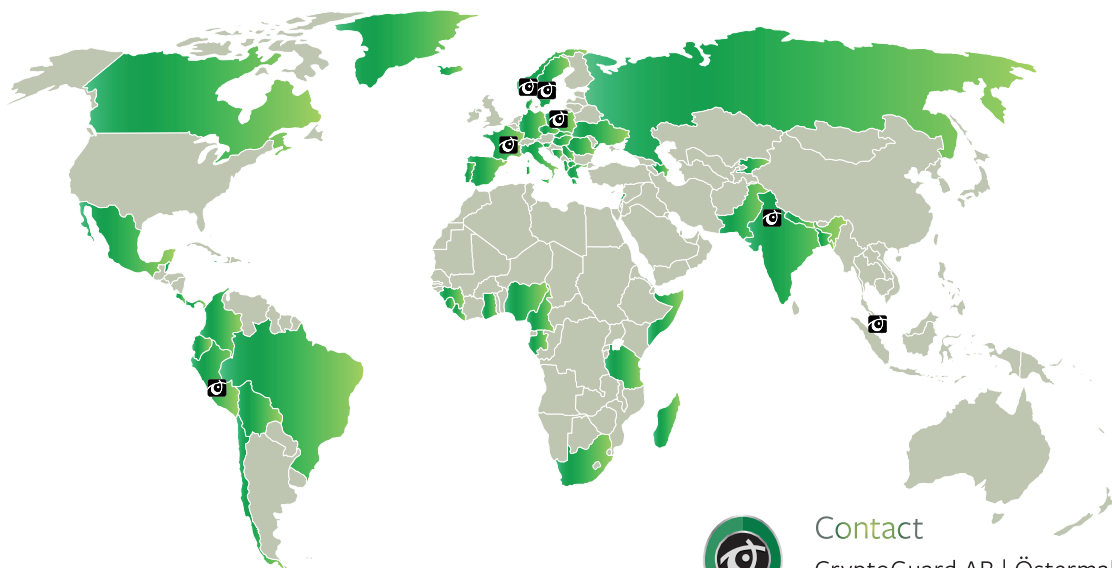
Miroslav Stantic, Executive Director for Network

Satcon | Congo, Gabon, Liberia, Sierra Leone

We have chosen CryptoGuard CAS in comparison with the majority of other competitors. The cooperation with CryptoGuard is amazing. CryptoGuard is a flexible, cost-effective and reliable CAS alternative in the market.

Bassam Fahs, IT and Technical Manager Satcon

CryptoGuard CAS - Deployed by 250+ operators in 50+ countries



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