

The title 'Irdeto Conditional Access' is written in a large, purple, sans-serif font. It is partially overlaid by a large, semi-transparent white circle that also contains a blurred image of a person's hands holding a device.

A fully renewable and scalable solution for protecting content and business models on broadcast and IPTV networks

Digital content piracy is a worldwide issue. Well-funded criminal organizations are constantly looking to exploit security systems and the explosion of illegal content streaming websites in recent years means this threat is now stronger than ever. Once the danger was limited to control word sharing and smart card tampering on managed STBs, but today's consumers view digital video on a wide variety of unmanaged devices. This leaves content vulnerable to

advanced hacking attacks at all points along the media pipeline.

To protect their revenue and reputation, operators need uncompromising and sophisticated conditional access solutions that are constantly evolving to address the latest threats. Preventing piracy is essential, but so is the ability to recover swiftly if a breach does occur, and to track down and shut off the source of any content leaks. Such renewable,

traceable security is increasingly central to operator growth strategies because it is a key condition of agreements with licensing authorities such as sports rights holders and Hollywood studios. To win the desirable, high-quality content that differentiates them from competitors, attracts subscribers and builds brand loyalty, operators must demonstrate continuing commitment to combating piracy.



## FOCUS ON COST-EFFICIENCY

In addition to the threat from pirates and pay TV rivals, operators also face a battle for subscribers with over-the-top (OTT) players and direct-to-consumer offerings from content owners. To counter the effects of so-called “cord cutting”, operators must keep prices low at the same time as adding value. Typically, this means investing in their own multiscreen services. For many operators, the adoption of software-based (cardless) conditional access in place of smart cards is an obvious choice as it reduces procurement, distribution and management expenses as well as STB hardware costs, without impacting security.

A sharp focus on operational efficiency is also necessary as the number of screens grows, to eliminate duplication of effort and technology across broadcast and OTT. Many pay TV companies are looking for ways to simplify security management in a multiscreen world, adopting unified processes for all content, whether the protection mechanism is CA or Digital Rights Management (DRM).



## FLEXIBILITY FOR THE FUTURE

While piracy and cost control are a common concern to all operators, the specifics of the services they run can vary widely from one market to another and over time. To stay ahead of their competition, operators need the flexibility to test and implement new business models and features that may appeal to their unique customer base. This can range from subscription and pay-per-view VOD (whether streamed, downloaded or pushed to the STB) to home networking, PVR functionality, or tie-ins with third parties such as OTT-services. All of these have implications for content security. To offer a truly dynamic, tailored service to their subscribers, operators need a CA system that supports a rich feature set and the ability to add these new capabilities quickly and easily over-the-air.

The Irdeto Conditional Access System (CAS), a solution in the Irdeto 360 Security portfolio, provides the most stringent content security for pay TV operations. It also enables pay TV operators and broadcasters to offer more services, payment options and device support. This equates to more choice, flexibility and convenience for their customers. Whether via cable, satellite, terrestrial or IPTV, Irdeto Conditional Access gives broadcasters the flexibility to easily deploy new TV services without interrupting existing subscriber services or compromising their digital assets.



## KEY BENEFITS

### **Stay ahead of evolving security threats with renewable, uncompromising security**

To protect your investments, Irdeto Conditional Access offers renewable security technology. This enables operators to remotely update both software-based and smart card security clients quickly and easily in the event of a piracy incident, without costly card swaps. An on-going roadmap of security enhancements ensures Irdeto CAS protects against the latest threat trends and is compliant with the changing requirements of all major content licensing authorities.

**Drive ARPU with attractive new features that can be added over the air**

Irdeto CAS is a fully-featured solution that includes a large number of modules and client options to support advanced functionalities such as VOD, home-networking and PVR. Over-the-Air updates give operators the flexibility to test and rapidly deploy new services to existing STBs in the field, improving the offering to their subscribers and creating an opportunity for the operator to raise ARPU.

**Minimize costs with flexible deployment options**

Available as either a smart card or software-based security client to dramatically reduce the total cost of ownership (TCO), Irdeto CAS can be configured to meet the needs of each specific market. Suitable for protecting content for broadcast or IPTV delivery to managed devices such as STBs, it can be tailored from small or medium-sized networks, to large-scale networks with millions of subscribers in a fully redundant setup. Also available as a managed service, Irdeto CAS is compatible with a wide range of set-top boxes, client devices, compression equipment and subscriber management systems. This open approach allows operators to select the components of their choice or rely on Irdeto for a pre-integrated, end-to-end solution.

**Introduce 4K Ultra HD (UHD) services with more control**

To obtain rights to early release movies or other premium content, operators must comply with MovieLabs’ Enhanced Content Protection (ECP) requirements for Secure Media Pipeline (SMP) to enforce output control. However, SMP must not be implemented simply as an on/off switch to allow 4K UHD content only on 4K TVs with HDCP 2.2 or above. Such an approach would severely limit operators’ support for subscribers since most devices in the home today do not support HDCP 2.2. To give operators more control, Irdeto CAS allows operators to define granular enforcement profiles to maximize their business models. For example, 4K UHD content not subject to MovieLabs ECP, such as sports or TV programs can be viewed on 4K TVs with HDCP 1.4. Operators can also maximize their 4K content investment by providing a lower resolution version of the content to HD, SD and analog TVs, enabled by the SMP implementation in Irdeto CAS.

	4K UHD early release, box office	4K UHD and premium content	Catch-up & VOD library	Free to air content
	SMP	SMP w/exceptions	SMP w/exceptions	No SMP
4K TV with HDCP 2.2	✓	✓	✓	✓
4K TV with HDCP 1.4+		✓	✓	✓
SD & HD TV		Down-res	✓	✓
Mobile devices		Down-res	✓	✓
Analog TV		Down-res	✓	✓



**DELIVERING CHOICE, FLEXIBILITY AND CONVENIENCE**

Irdeto CAS enables pay TV operators to offer a wide range of services, payment options and supported devices. This in turn allows them to offer increased choice, flexibility and convenience to their customers.

**Effective And Vigilant Anti-Piracy Efforts**

Operators can’t afford to rely entirely on measures and technologies aimed at preventing piracy. They must respond effectively when piracy does occur. In addition to the best-in-class security technology at the core of Irdeto CAS, Irdeto continuously provides advanced countermeasures as plug-ins to

the system. These enhancements help operators respond quickly to new threats and ensure rapid recovery.

To effectively utilize these tools, Irdeto offers a suite of services to help operators manage security over the lifecycle of the content. These services range from ensuring site security and auditing operator platforms and devices, to watching and defending on an on-going basis and keeping security up-to-date to stay ahead of ever-evolving security threats.

## Renewable Security

The cornerstone of Irdeto's security strategy is renewability, enabling operators to update the headend and deployed clients quickly and easily. This renewability is powered by Irdeto's unique FlexiFlash mechanism which is integrated into both the Irdeto software-based and smart card clients, ensuring an end to costly card swaps. FlexiFlash is used to introduce new features and piracy countermeasures as plug-ins to the system, resulting in shorter development, test and release times and faster response and recovery when new threats and incidents arise.

## Future-proof cryptography

The Irdeto Key Management System (KMS) uses the latest advances in cryptography to create Irdeto-specific algorithms and an operator-unique cryptographic layer, resulting in:

- No single point of security failure.
- Higher resistance against attacks with proven cryptographic strength and indefinitely updateable algorithms.
- Reduced impact from any individual threat – the use of diverse primary keys across each device type and model ensures that in the event of a key being compromised, only a small subset of devices can be affected. The risk cannot be spread to other devices or operators.

The KMS is an essential component of the Irdeto Integrated Management System (IMS) which allows operators to centralize administration of content security across both CA and DRM.

## Countermeasures against control word sharing (CWS)

Irdeto CAS provides effective defense against CWS, including:

A heuristic algorithm to detect smart cards used for control word redistribution.

An improved communications interface layer with intellectual property rights (IPR) support to enable prosecution when a smart card is used in emulation STBs.

## A variety of pay TV options

Irdeto CAS offers a large number of optional modules to support advanced functionalities. This

enables operators to provide more flexibility to subscribers and increase ARPU. Supported services include:

- 4K Ultra HD MovieLabs support with secure media pipeline.
- Home network sharing.
- Video on demand (Subscription or pay per view).
- Impulse pay per view (PPV).
- Personal video recorder (PVR).
- Digital rights management (requires PVR).
- CI+ Conditional Access Module (CAM).
- Proximity control.
- Remote ECM generator.

## Flexible Deployment models

The Irdeto CAS can be deployed in multiple different configurations and across a variety of client devices to address unique business, security and operational requirements. It can also be provided as a managed service. Irdeto's solutions are compliant with industry standards, enabling interoperability and ease of integration with third-party products to provide maximum choice to operators.

CI+ CAM for integrated digital television (iDTV)  
A variety of pay TV services, such as home network support and PVR, can be delivered directly to the iDTV set without the need for an STB.

## Home networking

Controlled sharing and distribution of subscriber content across multiple screens (both secondary TVs and unmanaged consumer devices) within a household. This also includes options for Download & Go on specific devices. For further information, please visit [Irdeto.com](http://Irdeto.com) to see the [Irdeto Home Networking Security solution overview](#).

## Multiroom

Content viewing in multiple rooms within a household from a single subscription.

## Proximity control

A cost-effective implementation to share content on the PVR via the home network while preventing STBs – and the content - from moving outside the home.

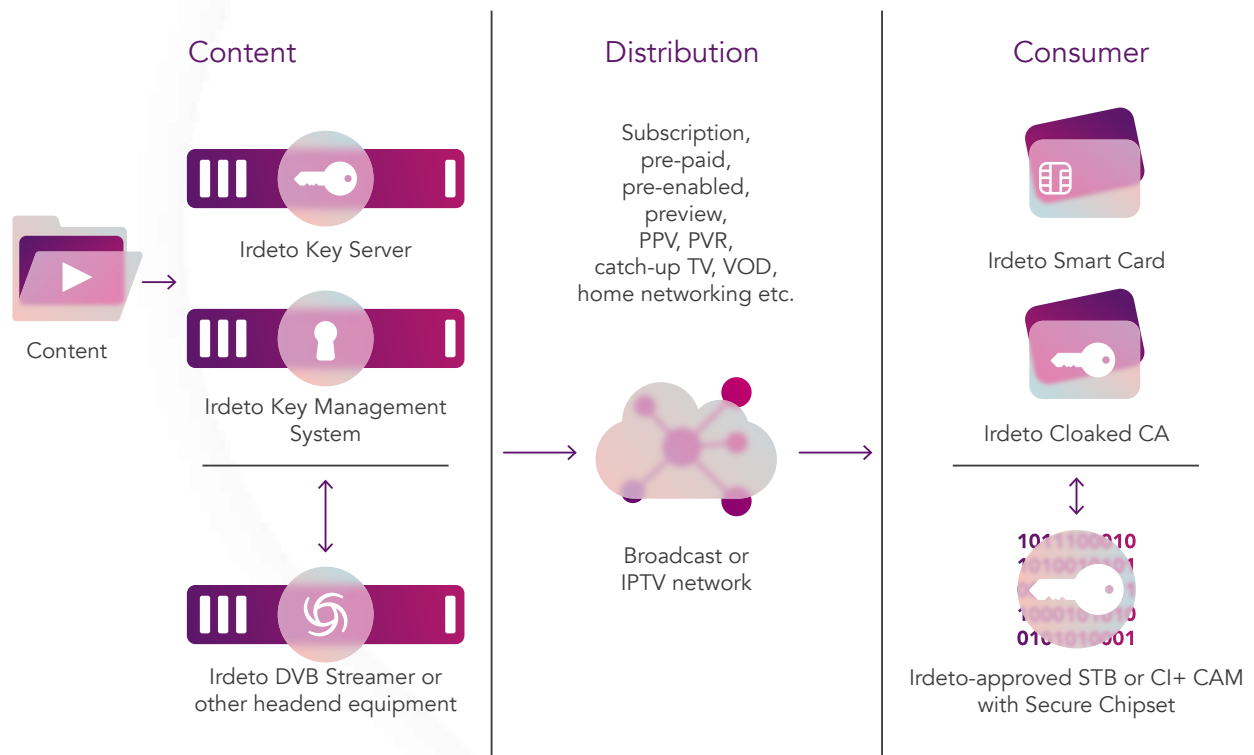


Figure 1. A flexible, renewable security solution that adapts to the demands of any pay TV market



## GROUND-BREAKING TECHNOLOGY

### Flexible Security Client Update

Irdeto Conditional Access is based on industry leading technology allowing smart card and software-based clients to be securely updated in the field. This feature, called FlexiFlash, is unique to Irdeto and allows for major security and functionality updates to the subscriber devices. Operators can use FlexiFlash to renew the complete CA client.

In Irdeto's customer networks, FlexiFlash has been proven to speed up the upgrade of functionality and enable proactive security updates and rapid response to piracy attacks. FlexiFlash helps operators to maximize their return on investment by extending the effectiveness of their CA solution, and renew security clients without disrupting subscribers' viewing experience.

### Secure Chipset

The Irdeto Secure Chipset solution is the ideal response to the challenges of securing a STB or CAM against two forms of piracy: control word

redistribution and device software tampering. Irdeto's secure chipset solution is based on:

- The presence of an advanced security descrambler chip in the STB or CAM.
- The unique personalization of this chip during production.
- A pairing relationship between the security client and the chip integrated into the device.

These attributes enable the smart card or software-based client to be securely bound to a device. In this solution, control word messages are uniquely encrypted as they pass between the Irdeto CA client and an advanced security chipset in the device. They can only be decrypted by the authorized STB chip which is paired to that card or client. This unique pairing between the device and the CA client ensures that targeted downloads can only be received by the intended device. Enhanced protection of the flash memory prevents attacks on services processed by the device.



## A Choice Of Hardware And Software-Based CA Client Solutions

Irdeto offers its customers the CA solution that best suits their content protection and business model requirements using both hardware and software-based security clients. Both solutions, when used with Irdeto's Secure Chipset technology, provide the same level of uncompromising protection against the latest forms of piracy and are fully upgradable while in the field. A unified headend system enables the operator to easily manage both clients, making a mixed-based deployment simple and cost effective.

Each security client uses a "secure container" to ensure it is highly robust against hacking, reverse engineering and tampering. Irdeto smart cards use the latest silicon technology available from leading manufacturers, while Irdeto Cloaked CA is protected by Irdeto's innovative security technology for source code obfuscation, data transformations and white box cryptography. This results in "cloaked" code that is meaningless to anyone who should attempt to reverse-engineer it.

## Architecture And Components

Each Irdeto CAS deployment consists of the following components:

### Irdeto Key Management System (KMS). Irdeto Key Server.

Depending on the operator's requirements, the following components may also be deployed to create a custom solution:

- **Irdeto Rights** – provides multi-DRM protection for OTT and home networking to unmanaged devices.
- **Irdeto DVB Streamer** – supports EPG services and STB updates by injecting CA messages into transport streams.
- **Irdeto Pre-Encryption Server (PES)** – enables VOD services by encrypting VOD assets with CA protection.



## GROUND-BREAKING TECHNOLOGY

### CAS-Related Services

Irdeto has an expert team of professionals to support a global customer base. A full range of professional services is available to meet customers' needs; including:

#### *Integration and customization services*

Requirements analysis for the design and development of the project, integration support for Irdeto components to manufacturers and partners, and technical integration consultancy to help Irdeto customers develop strategies and innovative ideas for their business.

#### *Headend implementation services*

System preparation of the Irdeto headend equipment and on-site installation services to help operators install and integrate equipment with minimal interruption to their services, and support operators with acceptance testing.

### *Training*

On-site operational and intensive product training to ensure the maintainability of the system. Introductory and Foundation courses on CA are also available. Customized training programs can be developed on request.

### *Testing and field trial support*

Develop tests and scripts, manage regression and extensive systems testing, reporting progress using quality software tools to deliver results to all levels of audiences within or outside the organization. STB and device verification testing is available, with associated device manufacturer support.

### *STB security evaluation service*

Provide operators with a comprehensive assessment of their integrated 4K Ultra HD STB in the context of the MovieLabs' ECP requirements. The service outlines how well the STB measures up and recommends any improvements that can



be made to maximize the operators' chance of securing premium content. It can be performed on all set-top boxes with Irdeto-certified secure chipsets. For more information, please refer to the STB Security Evaluation Service overview. Security lifecycle services audit, update and implementation services

Conduct an audit of the CAS location, configuration and management processes based on CA Site Security Certification requirements, help operators mitigate the risk of piracy and fraud resulting from incorrect and unsafe operation of the CAS, reduce vulnerability to social engineering attacks.

#### CA system optimization service

Provide an assessment of customer's content protection system and its environment in order to give appropriate recommendations for configuration, tuning, system implementation, security improvement and to support implementation of such recommendations.

#### Managed services

Provision of 24x7 Security Operations Center (SOC) for 1st line support, off-air CA broadcast and platform monitoring.

#### Customer support services

24x7 SOC for 1st line support, 2nd line support for more complex problem analysis, bug fix implementation, system upgrades and updates. Piracy control and cybercrime management. For more information on this end-to-end suite of services for brand and revenue protection, [please see the Piracy Control & Cybercrime Management solution overview.](#)



## SUMMARY

Irdeto CAS is a secure, flexible and cost-effective CA System that addresses the full range of security challenges faced by pay TV operators in the modern market. It can be deployed as either a cardless or smart card-based solution. The software-based implementation, Irdeto Cloaked CA, is the most advanced and widely deployed cardless conditional access system for broadcast operators worldwide. It has been independently audited and certified. It is most recently audited by Farncombe (Cartesian) in July 2017 for compliance to MovieLabs' ECP requirements, where it received the highest possible score for enforcing the stringent usage rules for 4K UHD premium content.

In addition to uncompromised security based on a hardware root of trust, Irdeto CAS is regularly enhanced with new plug-ins that guard against the latest content security threats. And if the worst does happen, built-in renewability ensures operators can rapidly and effectively recover from any piracy incident. Together, these features



Company	IRDETO
Product	CLOAKED CA CARDLESS
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Cartesian, Inc.

protect the operator's content investments, revenue, and reputation. With approval from leading licensing authorities such as Hollywood Studios and sports rights owners, the solution is an integral part of negotiations to secure the most attractive content including 4K Ultra HD.

Selecting Irdeto CAS can deliver significant savings on both capital and operational expenditure. Irdeto Cloaked CA can reduce total cost of ownership by as much as 40% through lower hardware, distribution and management costs.



Operators naturally keep their market under constant review because consumer demands are always changing. To help our customers stay agile and fit for whatever the future brings, Irdeto CAS has built-in support for a full range of business models and advanced features to suit developing business plans. From home networking and PVR capabilities to pre-pay models or VOD streaming and downloads, over-the-air deployment capabilities mean operators can develop, test and roll-out these new services quickly and efficiently.

Irdeto is the world leader in digital platform cybersecurity, empowering businesses to innovate for a secure, connected future. Building on over 50 years of expertise in security, Irdeto's services and solutions protect revenue, enable growth and fight cybercrime in video entertainment, video games, and connected industries including transport, health and infrastructure. With teams around the world, Irdeto's greatest asset is its people and diversity is celebrated through an inclusive workplace, where everyone has an equal opportunity to drive innovation and support Irdeto's success. Irdeto is the preferred security partner to empower a secure world where people can connect with confidence.