Conditional-access-provider strategies: Multiscreen and emerging markets are key to sector’s prospects

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- Conditional access is the fundamental technology that enables pay-TV operators to ensure that only paying subscribers receive their services.
- Keeping ahead of the “pirates” is key to the prospects of conditional-access providers, which typically invest more than a quarter of their revenues in research and development in order to improve their products.
- In recent years, conditional-access providers have expanded into other areas of TV-related technology, benefiting from the growth of the multiscreen delivery of TV content to personal computers and mobile devices.
- The growth of pay TV in “emerging markets” – notably China and India – offers the conditional-access providers plenty of potential for new customers and expansion. But competition between them, and against local technology providers, is likely to be increasingly tough.
- Informa Telecoms & Media believes that the potential offered by emerging markets and additional multiscreen products is sufficient to guarantee profitable future business for all the main players involved. NDS, the sector leader, is in good shape to move further ahead of its rivals.

Overview

Conditional access – the protection of television content by making encrypted signals available in viewable format only to customers who pay – is fundamental to the pay-TV business. Without conditional access there would be no pay-TV operators, and the latter’s businesses have, from time to time, been put under pressure when conditional-access systems have been compromised – when consumers take advantage of “pirated” reception equipment and smart cards to receive pay-TV services without paying platform operators or broadcasters.

The fundamental task of conditional-access providers is thus to ensure that pay-TV transmissions are secure and that, in the event of a successful hacking, any damage is kept to a minimum. Substantial investment in research and development to improve security is a critical part of the business of conditional-access providers.

Conditional access is these days only one part of the business of its providers, which have expanded into other areas of TV-related technology, in particular those related to the delivery of TV content to multiple screens (such as PCs, mobile phones, tablet computers and video-game consoles) beyond the TV set. These new activities include the following:

- Digital rights management (DRM), to protect audiovisual content delivered “over the top” (OTT) via the Internet and stored in digital video recorders (DVRs).
- Interactive TV middleware.
- Search and navigation: electronic program guides (EPGs) and user interfaces.
- “Home gateway” technology.

In terms of future business growth, operators are looking in two directions: first, growth in mature pay-TV markets from the provision of additional technology for multiscreen services; second, expansion in “emerging markets” (mainly the Far East and Latin America), where pay TV is less developed. The focus in these emerging markets is initially on providing conditional-access products, with the more advanced technology for multiscreen services coming later.

Most conditional-access products in the pay-TV sector involve the use of smart cards in set-top boxes. The content is protected by a combination of hardware and software elements, and smart cards are replaced regularly (typically a new generation is issued every three to five years) as operators seek to keep security robust. In the event of a serious hack, new smart cards can be issued.
In recent years, companies such as NDS, Nagra and Viaccess have also been offering cardless (or “embedded”) versions of their conditional-access products – first, for two-way networks (typically the IPTV services of telephone companies) where the “return path” is always on, and more recently one-way cardless products for broadcasters. Although the latter offers less security, it is deemed suitable for emerging markets, where the value of the TV content that is being protected by conditional access – and the concomitant risk of piracy – is relatively low.

The players

Three main kinds of players are involved in the provision of conditional access to pay-TV operators: TV-technology specialists for which conditional access is the main line of business; big set-top-box manufacturers that bundle conditional-access products with their consumer-premises equipment; and technology units of big telecommunications groups (see fig. 1).

<table>
<thead>
<tr>
<th>Company</th>
<th>Ownership</th>
<th>Type of company</th>
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<tbody>
<tr>
<td>NDS</td>
<td>Permira/News Corp.</td>
<td>TV-technology specialist</td>
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<tr>
<td>Nagra</td>
<td>Kudelski Group</td>
<td>TV-technology specialist</td>
</tr>
<tr>
<td>Ineto</td>
<td>Neapco</td>
<td>Unit of multinational media group</td>
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<tr>
<td>Motorola Mobility</td>
<td>Google</td>
<td>Part of set-top box division of equipment supplier</td>
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<tr>
<td>Cisco (Scientific Atlanta)</td>
<td>Cisco</td>
<td>Part of set-top box division of equipment supplier</td>
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<tr>
<td>Viaccess</td>
<td>France Telecom</td>
<td>Unit of global telecommunications group</td>
</tr>
<tr>
<td>Conax</td>
<td>Teleror</td>
<td>Unit of global telecommunications group</td>
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Source: Informa Telecoms & Media

NDS

NDS was created in 1988 by a group of Israeli scientists. It was sold to Rupert Murdoch’s News Corp. in 1992 and floated as a public company on the NASDAQ exchange in 1999, with News Corp. holding the majority of shares. In 2009, the company was taken private, and it is now owned by European private-equity fund Permira (51%) and News Corp. (49%).

NDS counts many of the world’s biggest pay-TV operators among its customers for its Video Guard conditional-access technology and other products. Customers include DirecTV (US), BSkyB (UK), CanalSat (France), UPC and Kabel Deutschland. In the emerging markets of Eastern Europe, Latin America and the Far East, leading customers include Romtelecom (Romania), DirecTV Latin America, Tata Sky (India) and China Central Television (China).

Nagra

Nagra, part of the Switzerland-based Kudelski Group, has been providing conditional access since 1989, when it licensed its first (analog) content-protection system to French pay-TV broadcaster Canal Plus. Since 1991, conditional access has formed the most important part of the Kudelski business, which also includes public access and audio products.

Nagra’s customers include many of the leading pay-TV operators in Europe and North America, such as Canal Plus, UPC, Mediaset and Echostar/Dish Network. In emerging markets, customers include TV Azteca (Mexico), TV Globo (Brazil), Sun Direct TV (India) and China Broadcast Corp. (China).

Motorola

US telecoms-equipment provider Motorola became involved in the conditional-access business with its 1999 acquisition of General Instrument, a US supplier of set-top boxes and other equipment to cable- and satellite-TV operators. Customers of Motorola’s MediaCipher conditional access include Comcast (US), Megacable (Mexico) and European cable operators UPC (various countries) and Ono (Spain).

In January 2011, Motorola's conditional-access activities were placed in a spinoff company – Motorola Mobility – along with mobile devices and set-top boxes. The move was the precursor to the acquisition of Motorola Mobility by Google, which plans to run it as an independent company. The main motive for the acquisition was to strengthen Google’s portfolio of patents to support its Android operating system.

Cisco (Scientific Atlanta)

The historic rival to General Instrument/Motorola in the US cable industry was Georgia-based equipment manufacturer Scientific Atlanta, with its PowerKey conditional-access product. Scientific Atlanta was acquired in 2006 by US networking-equipment manufacturer Cisco,
which now includes PowerKey technology in the set-top boxes and head-end equipment that it sells to pay-TV operators.

Customers for its conditional-access products include US cable operators Time Warner Cable and Cablevision Systems, Rogers (Canada) and i-Cable (Hong Kong). In recent weeks there have been rumors that Cisco might seek to sell its set-top-box division, which could include the sale of the conditional-access business.

Viaccess
Viaccess, wholly owned by France Telecom Orange, has evolved over the past two decades from being totally focused on providing conditional access to pay-TV operators into a more wide-ranging provider of TV technology and enabler of the multiplatform distribution of audiovisual content. Viaccess' customers include Orange itself (in France, Spain and some other markets), Cyfra Plus (Poland), Boxer (Sweden), Telefonica (Spain) and Star India. It is seeking to win more big pay-TV operators as customers and to expand in the emerging markets of Asia and Latin America.

Conax
Conax, wholly owned by Norwegian telecoms operator Telenor Group, provides conditional access, DRM and other security technology for broadcast, broadband and OTT services delivered to set-top boxes, personal computers and mobile devices. Its latest product, Conax Contego, is a generic content-security platform that is designed to support any distribution technology and a multitude of consumer devices. Conax customers include Digittenne (the pay-TV service of Dutch telecoms group KPN), Com Hem (Sweden), Canal Digital (Nordic region), Cablemas (Mexico), National Cable Networks (Russia) and Dish TV (India).

Irdeto
Irdeto, a subsidiary of multinational media group Naspers, which has headquarters in both Hoofddorp, the Netherlands, and Beijing, provides a range of security and television technology, including conditional access, DRM, middleware and content management. In 2006, Irdeto boosted its business by acquiring the Cryptoworks conditional-access operation from Dutch consumer-electronics manufacturer Philips. Irdeto pay-TV customers include Ziggo (the Netherlands), TV Cabo (Portugal), MultiChoice Africa, China Central Television and other operators in China. It also provides its ActiveCloak DRM security system to online-video provider Netflix.

Business strategies
Keeping content secure
The fundamental task of conditional-access providers is thus to ensure that pay-TV transmissions are secure and that, in the event of a successful hacking, any damage is kept to a minimum and that signals are secured again as rapidly as possible. It is a cat-and-mouse game in which the “pirates” are constantly deploying reverse engineering to find a way around the latest technological innovations of the conditional-access providers.

In the late 1990s and early 2000s there were some serious problems with pay-TV piracy: Operators such as satellite pay-TV providers Telepiu (Italy) and EchoStar (US) and DTT pay-TV operator On Digital (UK) were all hit, with the result that millions of homes were receiving pay-TV services without making legitimate payments for them. In recent years, though, the conditional-access providers have generally held the upper hand in the battle against piracy, and NDS, the sector leader, can boast that its systems have remained unhacked for more than a decade.

As well as investing substantially (typically between a quarter and a third of revenues) in research and development that helps improve the security of conditional-access systems, the providers have taken various steps over the years that have served to make life harder for the pirates and more secure for the pay-TV operators. They include the following:

- Regular issuing of new generations of smart cards (the typical smart card will be in use for three to five years).
- A range of security features embedded into smart cards that can be turned on and off during the lifetime of the cards.
- The incorporation of part of the content-protection security into chipsets.
Increased segmentation between operators: By giving different versions of their conditional-access technology to different operators (based on different sets of algorithms), a successful hacking of one platform does not create the risk of a domino effect, in which other platforms that use the same system are opened up to piracy.

In the event of a successful hacking of a system, the conditional-access providers will initially deploy a variety of electronic countermeasures to try to repair the security breach. As a last resort, they will issue a new generation of smart cards in which the aspect of security that has been breached by the pirates has been fixed.

Expanding from CA to DRM

With the advent of TV content delivered not only via broadcast and managed IPTV networks but also “over the top” (OTT) via the public Internet to personal computers, conditional-access providers have been given new opportunities to provide content-security technology to their pay-TV-broadcaster customers.

DRM (digital rights management) is used to secure both OTT content delivered to PCs, TV sets and mobile devices and programs that are transmitted (protected by conditional access) over broadcast networks and then stored for later viewing in devices such as digital video recorders (DVR).

Offering DRM alongside conditional access has become a necessity for the conditional-access providers, though some were quicker off the mark than others: Viasat launched its first DRM product in 2002, while NDS was perhaps surprisingly late to the game, unveiling its VideoGuard Connect product in 2011.

In offering DRM technology, companies such as NDS, Nagra, Viaccess and Irdeto are competing not only with each other but also with big US computer and software companies, such as Microsoft, Google and Apple. NDS has said that it regards its main future competition as coming not from Nagra but from the likes of Microsoft and Google.

Multiscreen moves

The advent of multiscreen TV has given conditional-access providers new opportunities to expand their businesses into related technology targeted at their pay-TV customers in markets (notably North America and Western Europe) where future growth from selling conditional-access products is limited as a result of the maturity of pay-TV markets.

As well as DRM to secure online-delivered and PVR-stored content, the established conditional-access providers are also offering other TV-related technology to pay-TV operators, including the following:

- Interactive-TV middleware.
- Advanced EPGs (electronic program guides) with enhanced search facilities.
- Software for DVRs.
- “Home gateway” technology that enables the set-top box to serve as the hub of a household network that integrates the delivery of broadcast, broadband and voice services to a variety of devices.

The conditional-access providers can play a key role in helping manage pay-TV operators’ multiscreen strategies and enable them to offer common services – with similar navigation and “look and feel” across multiple devices.

In recent years, conditional-access providers have made strategic acquisitions (see fig. 2) that have increased their ability to offer additional technology to their pay-TV customers (see fig. 3).
It is still early days for some of these new products – for instance, few operators have taken the plunge into home gateways – but they are likely to account for a growing share of the revenues gained by the conditional-access providers over the coming years. As well as providing new sources of revenues, by providing additional services to pay-TV operators the conditional-access providers are able to reinforce their core content-protection products, which are integrated into the new technologies.

**Expansion in emerging markets**

At the same time, the sector is looking for much of its growth to come from “emerging” markets, where there is still plenty of room for growth by pay-TV services and where many multichannel-TV networks still have not made the transition to digital broadcasting. Such markets offer immediate opportunities for selling conditional-access products and, as they develop, will also offer the potential for additional sales of advanced technology for multiscenario distribution.

South America has for some time been a key region for many conditional-access providers and has recently been joined by China, India and other states in Asia as important targets for future growth.

The downside of the emerging markets is precisely the fact that they are countries with lower levels of household income than in North America or Western Europe. ARPU (average revenue per user) is much lower (see fig. 4), and as a result, operators might not be able to spend as much on hardware and software for their TV sectos as operators do in richer countries.
So conditional-access providers need to keep their costs down if they are to prosper in poorer countries. One approach that several players have adopted is to provide cheaper forms of conditional access in the form of “embedded,” or cardless, products.

Although this might mean offering a lower level of security – if the system is successfully hacked, new hardware (that is, set-top boxes) would need to be provided to subscribers – in many cases the rewards appear to outweigh the risks. Like the content-security companies it challenges, “piracy” is a business that requires investment, and those involved are seeking substantial returns on that investment. Content that is relatively low value – as would be the case with many pay-TV services in emerging markets – offers little in the way of potential return to the pirates.

However, what is true today might not be true tomorrow, and the value of content in developing markets is likely to rise. So operators that opt for embedded conditional access might well choose to deploy set-top boxes that also have a slot for a smart card so they can upgrade to card-based conditional access without having to issue new boxes.

### Business models

The essential business model pursued by conditional-access providers is the licensing of their technology to pay-TV providers, but there are some variations in the way this has been done.

For many years the typical business model deployed by conditional-access providers involved charging a substantial upfront fee to license their technology to pay-TV operators and then additional per-subscriber fees. This model made good sense in the early days of pay TV, when operators had relatively few subscribers. But in recent years, there has been a trend toward a service or subscription model, where the vast majority of revenues come from per-subscriber license fees.

One key advantage of the service model is that it makes revenues more predictable and even out the peaks and troughs that tended to come with the earlier model. Another factor with per-subscriber fees is that the success of a conditional-access provider depends very much on the success of the pay-TV operators to which it licenses its technology.

US set-top-box manufacturers Motorola and Scientific Atlanta (Cisco) have generally followed a slightly different approach, in which conditional access is bundled in with the set-top boxes and headend technology they provide to cable operators. This can have the effect of making conditional access appear somewhat cheaper than if is bought from a stand-alone provider, though at the cost of lesser flexibility. Some operators prefer to buy the hardware and software for their networks on an individual basis rather than taking a whole bundle from a single
manufacturer. Although the Motorola and Scientific Atlanta approach has had much success in the US cable sector over the years, it has never really taken off in Europe, where operators have generally preferred to buy individual components for systems rather than all-in-one offerings.

However, in some emerging markets, operators are demanding that conditional-access providers such as Nagra and Viaccess provide their conditional-access products as part of a bundle that includes set-top boxes. In this case, the operators have chosen not to become set-top-box manufacturers themselves but to acquire the equipment from manufacturers (typically in China or South Korea) and then sell it on to their pay-TV customers alongside conditional access and other services.

In terms of the other products that conditional-access providers offer their customers – such as DRM, middleware, EPGs and home-gateway services – the model is again usually that of software licensing with additional income coming from providing systems integration and professional-services support.

**Competition**

Four main factors affect the level of competition between the conditional-access providers (see fig. 5).

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**Fig. 5: Global, conditional-access providers, competition factors**

Source: Informa Telecoms & Media

**Incumbency bias**

The nature of conditional-access technology is such that conditions will nearly always favor the incumbent provider. The process of changing conditional-access provider will typically involve having to issue new set-top boxes, a step that operators would generally be reluctant to take unless there were other reasons to do so. Provided that the conditional-access provider keeps its systems free from piracy, operators will generally have little motive for seeking a change.

A conditional-access provider that is seeking to “poach” a pay-TV operator from a rival can take advantage of occasions when operators are seeking to upgrade the networks with the issuing of new set-top boxes. The transition from analog to digital television – which is still in its infancy or adolescence in many parts of the world – offers such an opportunity, as does an upgrade to advanced set-top boxes and home gateways.

**Importance of additional services**

In this latter context, a conditional-access provider that is able to offer advanced TV services for multiscreen delivery has an advantage. In the future, the competition between the conditional-access providers is likely to be as much related to their other products as to their core content-security technology.

As pay-TV operators and broadcasters (both pay and free-to-air) seek to deliver content-protected services to personal computers, mobile phones, tablets, games consoles and other devices, they are opening up new revenue opportunities for conditional-access providers able to deliver suitable technology for these additional platforms.
At the same time, the traditional conditional-access providers are going to face an increasing challenge from the likes of Google (which has itself become a conditional-access provider through the acquisition of Motorola Mobility), Microsoft and Apple, which are also providing technology that enables TV-based content to be distributed via the Internet to a wide range of devices.

R&D investment is fundamental

One key factor that is likely to determine the success of the individual conditional-access providers is the amount of resources they dedicate to research and development. For companies whose products need to be frequently updated in order to avoid the risk of piracy and to satisfy the increasing demands of the pay-TV sector for new technology to underpin their multiscreen expansion, research and development is perhaps their most important activity.

There is a chance that fortune will favor the providers that spend the most on research and development, and it would not be surprising to see NDS enhance its position as sector leader in the years to come.

NDS might come across as rather arrogant when it dismisses Nagra as a “follower” rather than a “competitor,” but the latter company is facing something of a struggle in the short term to maintain its position. Nagra has been hit by the economic downturn in some countries and by the negative impact of a strong Swiss franc. It has been forced into a cost-cutting program, involving layoffs of 9% of its staff, which might limit its room to maneuver.

Big battle for emerging markets

A key strategic goal for most conditional-access providers is to gain new business in emerging pay-TV markets, and a lot of executives are focused on the promise of China and, especially, India, as well as other countries in the Far East, Latin America and (to a lesser extent) Africa.

These markets offer plenty of room for the conditional-access providers to expand their businesses as pay-TV penetration rises and as the digital distribution networks (cable, satellite, IPTV and DTT) grow. A case could be made that “a rising tide lifts all boats” and that all the conditional-access providers should benefit from new revenue streams from the emerging markets to supplement their income from the mature pay-TV markets of North America and Western Europe.

But some providers are perhaps better placed than others, having already established roots in the key markets of China and India. NDS, for instance, has benefited from News Corp.’s courting of China’s communist government over many years and counts a dozen Chinese pay-TV operators among its customers. Irdeto has also been proactive in this market, adopting a dual-headquarters strategy in 2007, with a second headquarters in Beijing. It claims a 17% share of China’s conditional-access market, which it says is higher than any other international player. Viaccess, in contrast, has yet to sign a customer in China.

However, it should not be assumed that the “emerging” markets will necessarily be willing to be colonized by Western technology providers. As NDS itself has noted, competition in providing conditional access and other TV technology in China is going to come from local providers (such as Tshinhua Tongfang) as well as the established European and American players.

Informa viewpoint

Informa Telecoms & Media believes that the potential offered by emerging markets and additional multiscreen products is sufficient to guarantee profitable future business for all the main players involved.

The conditional-access sector has generally been characterized by long-term relationships between providers and customers, and mergers between the players involved are rare – the most recent being the 2003 sale of Canal Plus Technologies to Nagra (the conditional-access part of the business) and NDS (the middleware business) and Irdeto’s 2006 purchase of Cryptoworks from Philips. There seems little reason to assume that the future will be significantly different (notwithstanding the possibility that Cisco will sell its set-top-box business and conditional-access operations).

NDS has established itself as the conditional-access sector leader, with an estimated market share of 27%, followed by Nagra (20%) and Motorola (11%). This could create a “halo effect” and attract more and more new business to the market leader. NDS is also particularly well placed
in the important Chinese market. Other players have their own strengths and established business relationships, which they will attempt to exploit as they seek future growth.