Secure Network Extension – Placeshifting the next generation.

“Envisage a world where watching TV on a PC or Mobile Phone is as easy and familiar as watching in your own living room”

Share our Network eXtended Vision.

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INTRODUCTION

NXVision transforms the way we watch TV, freeing viewers to watch all their favourite programmes live or recorded, in another room or even another country. Instantly and with ease creating an extension of the living room wherever the viewer wants to watch, be it on a laptop, desktop, mobile phone or other devices.

We are all used to getting access to music anywhere and anytime, either by radio or MP3 players etc. Now the world is ready for TV anywhere, where live and pre-recorded content can be watched anywhere, on a range of devices, without the need to carry any new or additional devices !

The key to the mass market adoption of MP3 players was to provide a simple, secure solution to downloading of music. NXVision believes that mass market adoption of placeshifting will be driven by a simple, secure system, which goes beyond placeshifting and in fact extends the users network to anywhere, on a range of devices.

Watch TV on your laptop whilst waiting for the flight back home ...

Whilst on the train to work catch up on the episode of your favourite show you recorded last night...

Catch up on local and international news in any coffee shop on the planet ....

Watch the latest sports event at home, while the main TV set is being used for soaps …

NXVision is a patented leap in technology that for the first time provides a seamless viewing experience for the viewer as well as complete copyright control for the content owner. Offering a business to business to viewer (B-B-V) solution, which rewards everyone in the content delivery & exploitation chain by enabling digital television stakeholders to offer a new service to their viewers.

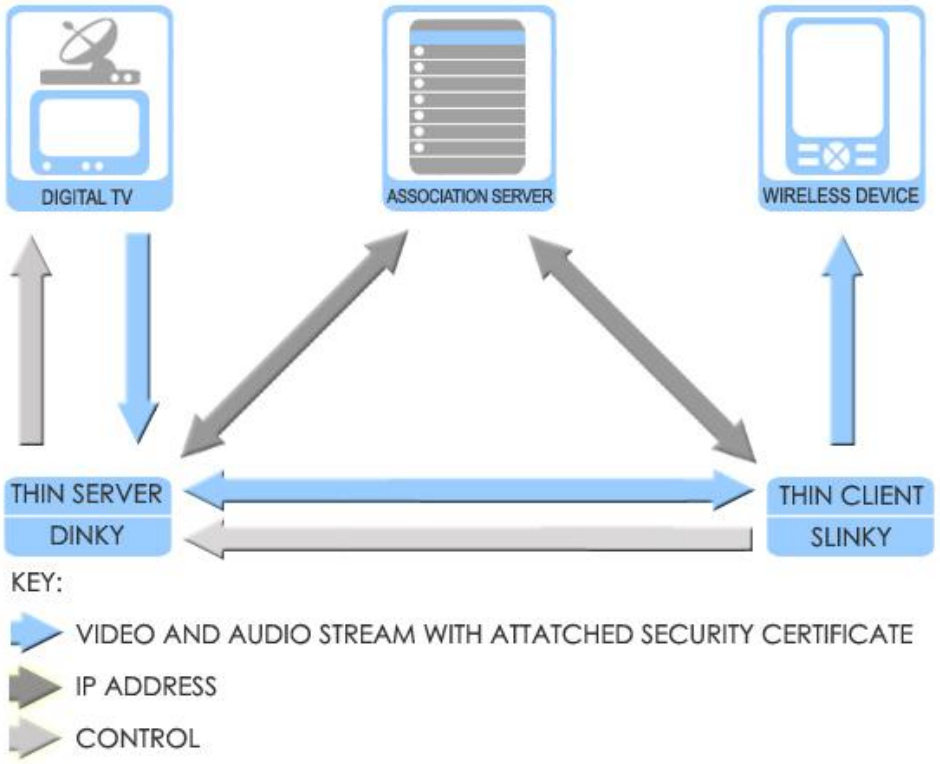
THE NXVISION ADVANTAGE

NXVision allows operators to offer a new service to their customers, using their existing infrastructure whilst ensuring that they retain control over their content. This service

- ✓ Uses existing “legacy” set-top boxes (STB)
- ✓ Supports a subscription / pay-per view or “free” pricing plan to the end customer
- ✓ Gives the operator full control over what happens to their content (can restrict content based on type, geography, or other rights based issues)
- ✓ Requires no new network infrastructure
- ✓ Can link together different business groups within a single company (e.g. TV and broadband operations, or TV and mobile operations etc).
- ✓ Maintains branding on small form factor devices
- ✓ Gives the end customer access to the live channels they are familiar with, and the pre-recorded content they want.

THE NXVISION SYSTEM

NXVision provides and manages a complete system for operators. This system consists of three components, Dinky, Slinky and an Association Server.



- Dinky – embedded software or add-on adaptor which adds secure placeshifting functions to a digital STB (including re-formatting the content for a mobile device and controlling quality of service etc).

- Slinky – software for a mobile device (phone, laptop, PC etc) which displays the TV content and also provide remote control functions.

- Association Server – provided as either as an administered service or as a solution for our customers. The Association Server allows any given user to find ***their*** STB without having to know anything about IP addresses / firewalls etc.

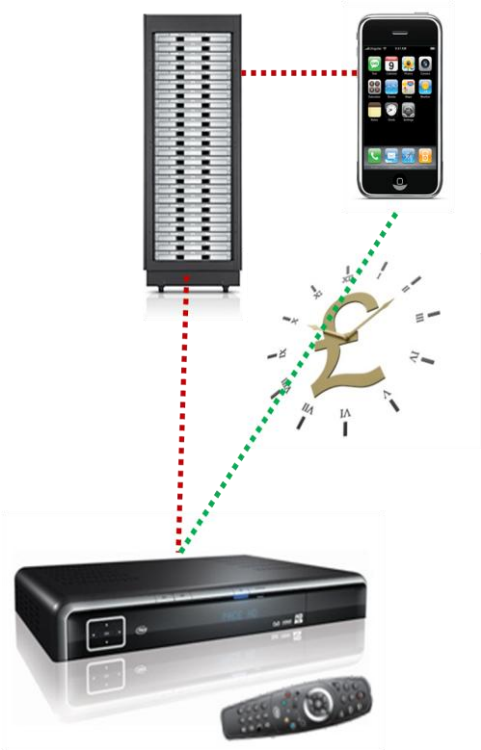
The end user starts a session by running the Slinky software on their device. This software then contacts the Association Server in order to get information relating to the users own Dinky, and also provides some device specific information. The Association Server exchanges information between Slinky and Dinky, and allows them to pair and start a peer-to-peer transaction. The data transfer between Dinky and Slinky (for example audio / video) is direct and does NOT flow through the Association Server.

To the end user, the system is as simple as starting the software, then choosing what to watch !

THE NXVISION COMPONENTS

Dinky

Dinky is a unique product which takes an incoming broadcast digital TV stream (live or pre-recorded) and transforms the high bit rate input into a version suitable for mobile devices and networks. Dinky is unique in that:-



- ✓ Dinky is built into the STB. For next generation STB's Dinky is a completely software solution, for legacy or existing STB's an add-on or dongle version is available.
- ✓ Dinky exists within the Conditional Access (CA) trusted zone. This allows access to full resolution broadcast content.
- ✓ Dinky supports Digital Rights Management (DRM) on audio and video content being sent to a remote client. This allows the operator to demonstrate to content owners that the content is safe and protected.
- ✓ Dinky allows access to live and pre-recorded content, based on the CA rules put in place by the operator. This allows the operator to block content, charge extra for events etc.
- ✓ Dinky allows access to different content than is displayed on the local TV set. The remote user can change channel, or request on-screen display data without the local user seeing any effect.
- ✓ Dinky provides any requested on-screen display information as data, which is then formatted by Slinky (see below) to fit the size of screen available. So for a laptop, all the information normally displayed on a TV can be shown, but for a mobile phone, only part of the data will fit within the available screen size. This vastly improves the user's experience.
- ✓ Dinky establishes a secure channel with Slinky and obtains information relating to the type of device Slinky is, as well as how it is connected to the network. This information is used for a constant Quality of Service (QoS) measurement, as well as setting up the maximum audio and video bit rates supported by the device.
- ✓ Dinky translates commands sent by Slinky to the format required for the particular host STB. The interface between Slinky and Dinky is constant, but different host STBs will necessitate different commands between Dinky and the STB.

Dinky is provided as a software license to STB manufacturers or a device license to hardware manufacturers if a dongle style Dinky is required.

Slinky

Slinky is a software program for a PC / laptop / mobile phone or other network connected device. Slinky displays the audio and video being sent from Dinky and is unique in that:-

- Slinky uses audio and video capability already existing within the device, where available. This reduces the size of Slinky, which is advantageous when downloading software.
- Slinky uses style sheets to take on the look and feel of the operators STB. The end user is presented with a familiar environment, down to the menu names and colours used.
- Slinky translates key presses to a standard communication protocol with Dinky.

- Slinky takes on-screen information sent by Dinky and displays only the information that can be supported by its screen size. Thus for a mobile device, a readable subset of information is shown instead of trying to show all the information, which is originally formatted for a 32" TV.

Slinky is provided as a software license to device manufacturers if it is to be pre-loaded onto devices. Additionally, Slinky will be available as a paid for download.

Association Server

The Association Server is a database located at a particular internet location. The function of the Association Server is to enable a given user to find their STB (in effect the user activates Slinky, and through communication with the Association Server, Slinky can then find the location of *their* Dinky and talk directly – without any user intervention). The unique features of the Association Server are:-

- ✓ Supports the exchange of information between Slinky and Dinky, allowing communication to start peer to peer. The information exchanged via the Association Server consists of small data packets, with no audio / video being sent through the server. This limits the infrastructure required for the server, as well as improving the performance to the end user.
- ✓ The Association Server can push adverts onto Slinky during certain events. These events could be during the initial association process, request of EPG data etc.
- ✓ The Association Server can track viewing statistics.

The Association Server is provided as a service to the Pay TV operator, or can be licensed to run within their server environment. The Association Server is operated with a per user / per month charge.

NXVISION SUPPORTED DEVICES

Set-Top Boxes (STB)

NXVision technology is designed to work across a range of STB's both as embedded technology and also as an add on accessory (dongle).

Embedded

NXVision technology working within a STB environment is designed such that the local user watching TV at home is completely unaware of any placeshifting activity. This is achieved by utilising the resources that exist within the STB SoC (such as video scalers, hardware decode blocks and CPU's). All of the NXVision technology exists within the main SoC, and no additional hardware is required. This means that the whole activity is within the trusted zone.

The embedded software is designed to work mostly within the driver layer, within minimal interaction with the middleware of the STB. NXVision technology has been demonstrated on Linux platforms as well as more specific STB silicon OS's (ST).

Currently NXVision has embedded solutions for ST Microelectronic and Conexant SoC's.

Dongle solution

For STB's with limited processing power it is possible to add NXVision technology using a low cost digitally connected dongle. This dongle carries out the main functions of secure placeshifting (such as video transcoding and quality of service) using a digital connection to the host STB. This digital connection can be either USB 2.0 or Ethernet.

A digital connection is used to connect the STB and Dinky to ensure that the video quality is not compromised, the data transfer can be secured, and that all of the advantages of the embedded dinky technology can be put in place with a low cost solution.

The Dongle requires minimal changes within the host STB, to allow an audio and video stream to be streamed through the digital interface. This stream is the same method as used for recording content to a HDD in a PVR style STB, the content is simply routed to a different interface.

Currently the dongle design is based around a ST7109 SoC from ST microelectronics, which is itself a STB SoC. The result of this is that the dongle is a trusted device as it can support all major types of Conditional Access.

The host STB can be based around any silicon, and NXVision has demonstrated working with STB's based around ST and Broadcom silicon, with others (such as Sigma Designs and Conexant) being progressed. Additionally NXVision has shown solutions working with both USB and Ethernet connectivity.

Client Devices

NXVision's Slinky client is designed to work across as wide a range of devices as possible. The client is "thin" in that it uses existing features within the devices to reduce the size of the client as much as possible.

The supported client list can be exhaustive, but includes the following. A full list can be supplied on request. (NOTE – all devices require internet access, through any connection, e.g. WiFi, ethernet, 3G, WiMax etc).

Windows XP / Vista computers (PC / Laptop).
Symbian S60 3rd Edition Mobile phones (such as Nokia N95 / N81 etc)
Symbian UIQ 3.x mobile phones (such as Motorola Z8/Z10, Sony Ericsson P1i, P990i etc)
Windows mobile phones (windows mobile 5 / 6 / 6.1 – such as HTC TyTn II etc)
iPhone / iPod Touch*
Blackberry Perl*
Selected additional handsets (such as Sony Ericsson K608i, V600, Z610i, Motorola V3x RAZR, LG U830, U880, U890).

*(Pending)

CONCLUSIONS

NXVision provides a next generation placeshifting system, or in reality a first generation secure network extension.

NXVision technology allows the home TV viewer to take their living room experience with them, wherever they go, and on a wide range of devices.

NXVision allows further monetisation of content by offering a new service to Pay TV customers with no additional infrastructure required.

NXVision can link together separate divisions within Operators, providing business benefit across the company (such as TV / broadband or TV / broadband / mobile etc).

NXVision maintains branding, and rights management across a range of devices.

NXVision technology works across a wide range of STB's (both new designs and existing models) and a wide range of mobile devices.


NXVision
Enabling, Extending and Versatile