

Fraunhofer FOKUS

IPTV Media Client Suite

Whitepaper

Overview

The FOKUS IPTV Media Client acts as an IPTV Terminal Function (ITF) and IMS User Agent (UA) align with ETSI TISPAN Release 2, Open IPTV Forum Release 1 and DVB specifications. It is available for Microsoft Windows platforms (Vista, XP, XP embedded), Linux and also as a Rich Internet Application using Microsoft Silverlight and JavaFX. The Media Client Suite incorporates NGN signaling towards telco infrastructures and supports all common NGN functionalities as VoIP telephony, Instant Messaging, Presence Services and in addition TISPAN/OITF IPTV signaling for channel and content selection. Media Control and delivery is handled, beside others, via the RTSP protocol using RTP streaming. An additional feature that allows an interaction between IPTV and common NGN services is the Rich Presence, which allows a visualization of the current viewed channel of friends available from the contact-list. This opens the door to various scenarios e.g. sending invitations to join a movie or live sessions. Another functionality allows incoming calls to affect the play-out. NGN messaging and telephony will be displayed as an overlay on the terminal as well as channel selection, VoD lists and the Electronic Program Guide (EPG) / Broadband Content Guide (BCG). Service Interaction automatically stops VoD streams on incoming calls or mutes the volume based on the User Profile.

The Media Client also incorporates community services as well as a best of YouTube service. A rating and recommendation engine is helping the user to make the right selection. A DLNA compliant stack enables the usage of services in the home domain (e.g. interworking with DNLA compliant consumer electronics).

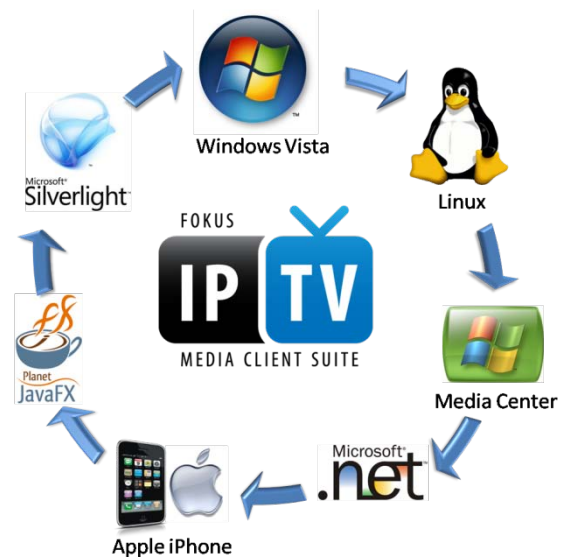


Figure 1: FOKUS IPTV Media Client Suite

Framework.

The Media Client Suite's Framework is composed as a modular application Framework, which offers a set of reusable components with a programmable API for developing various IPTV and NGN applications and services. To ensure a modular and interchangeable combination of services, the client's architecture follows the Microsoft Composite Application Block (CAB) pattern. In addition to the basic NGN services the client combines and offers a huge set of media-related services, but principally the IPTV features empowered with community aspects and cross fertilization with NGN.

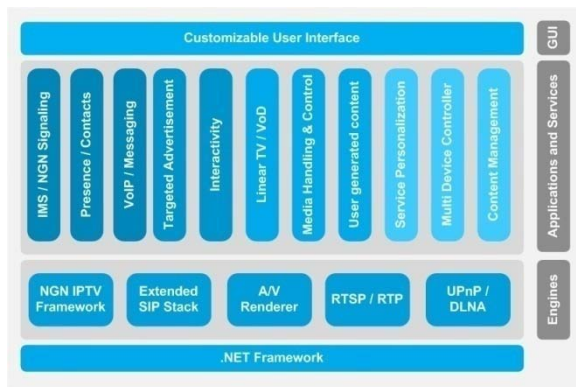


Figure 2 : FOKUS Media IPTV Media Client framework

Features and Services

The Application Layer consists of different service modules including basic NGN and IPTV services. The application layer is open for new services using a dynamic Plug-In mechanism and is already prepared for future extensions. This offers the opportunity to build new innovative services based on the existing framework functionality or as a completely new deployment e.g. new branding based on the customer's needs.

FOKUS IPTV Media Client – Windows Version

IPTV & Streaming Features

There are several components responsible for showing the content in the client like an exchangeable Streaming Subsystem using either Open Source Player technology, embedded Microsoft Windows Media Player 11 and Windows DRM or Third Party Filter Graphs (enabling RTSP/RTP and IP Multicast). Additionally there are different services involved on the server side explained as followed.

Linear TV

Provides Live TV as well as Internet Portal plug-in (e.g. YouTube) for continuous media consumption.



Video on Demand

Enables content selection from on-demand available media servers with trick function support for stream control and an interface to the recommendation engine.

Portal Pages

Portal Pages offer VoD Content sorted by the category and episode in a well designed web-like view. Furthermore each Portal Page has personalized, interactive and selectable advertisement banners, based on the user's interests.



Recommended VoD Content

The engine predicts media content that a user may be interested in based on user ratings and the personalized user profile.



Wonderland Channel

Similar to the Recommended VoD Content, but also includes Live TV and Web Content recommendations and a more advanced recommendation engine.

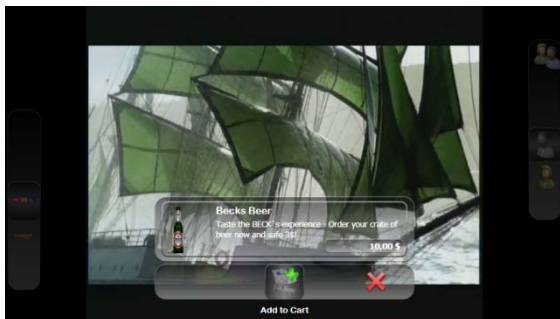
Quiz-Show

The Quiz-Show is an example of an interactive and community based service. With the help of this service two or more user can compete against each other in an interactive quiz show. In this case the user can answer questions, see each other via a web cam and possibly win prizes like free VoD content.



Targeted Advertisements

To allow more state of the art advertisement scenarios the client includes a system to trigger targeted and personalized ads. This includes content-driven user interaction by object highlighting and an immediate back channel support.



E-Commerce / In Channel Shopping

The interactivity of the client also allows directly offering products to the customer. E.g. this could be video on demand or other

content as well as different products or product samples in advertisements.

Electronic Program Guide (EPG)

The EPG provides the UE with service information around the TV program as a TV-Anytime compliant content description.



Home Media

Provide unified and ubiquitous access to all media in the home domain throughout UPnP / DLNA support.

Hybrid DVB Broadcasting

A so called DVB Hybrid Client allows using the whole functionality of the normal client with the difference of managing the Live TV content on its own over a DVB device, instead of getting it as a stream over the network.

NGN & Cross Domain Telecommunications

• Contact/Buddy List

The real-time contact list shows the contacts presence state as well as enhanced IPTV presence information.

• Presence

Provide presence information management. All presence related data is announced via SIP based subscription notification mechanism based on NGN standards or MSN.

• Messaging

The client offers a messaging feature which can be used for content related user interaction for example.

• **VoIP-Telephony**

Provides support for VoIP based audio communication sessions between clients.



Remote Control Devices

To satisfy the different user needs in interacting and operating the client, there are several different control devices which enable an intuitive and ease of use of the client. Additionally the User Interface is design in a way that easily allows adopting other devices or changing it to personal needs.

• **Microsoft Remote**



With the Microsoft Remote the user has the possibility to interact with the client in a way he is used to from a usual Television.

• **Apple iPhone Remote Control**



Another nice approach is an iPhone Application which allows a usual remote operation of the client. This includes different control views for the different views of the client. In this case different buttons are show when you are watching video on the demand (trick functions) or navigate to the menu. Additionally it allows to type in messages and more advanced interactions.

• **Wii Remote**



A more Natural User Interface (NUI) approach is realized with the help of a Wii Remote, allowing the navigation through the client with gestures.

• **Mouse / Tablet**



Additionally to the gesture support the User Interface supports touch screen and point and click interaction.

• **Keyboard**

Generally all functions within the client are accessible over keyboard shortcuts.

IPTV & Telco Cross Fertilization

The interaction of NGN and IPTV services results in a set of innovative, value added services. Extending them with communities, web content, home media and of course user interactivity involves a new experience in consumption of multimedia services.

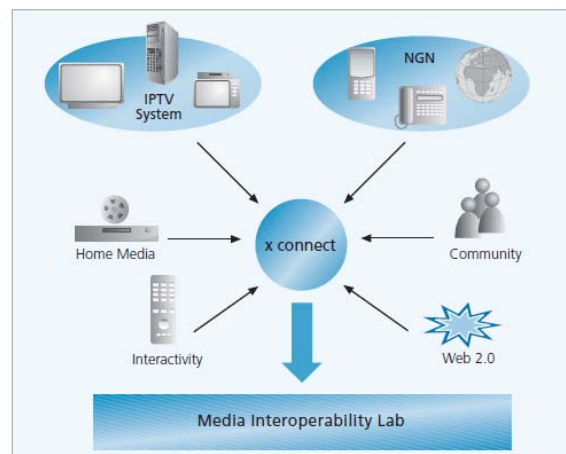


Figure 3 : Interaction of NGN and IPTV services

The following examples shall provide an insight into possible new services:

• **Interactive Adaptive Media Services**

Personalized targeted advertisements, voting, and shopping services are provided using the profiling capabilities as well as the back channel of the NGN infrastructure.

• **Watch The Same**

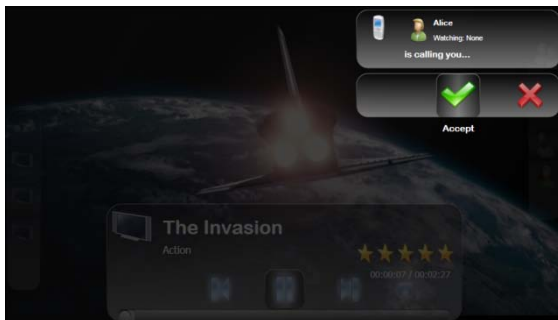
Makes use of the enhanced IPTV Presence information to enable the user to easily see and switch to the current channel watched by his friends.

• **See What I See**

Send recommendations to friends using SIP Messages including information of the current watched channel.

• **Display incoming calls on TV**

The interaction comes up with an incoming call, which is displayed as pop-up on TV-screen. For an on-demand stream the video will be paused during the call. After hanging up the stream will automatically resume at the same position. For live TV the audio level will be muted for the duration of the call.



• **Video follow me**

Taking advantage of the “single-sign-on” principle, a media session can be transferred from one terminal to another.

Client Platforms & Technical Background

Windows Version

Requirements:

- 1.5 GHz CPU and 256 MB RAM, 500 MB free hard disk, Video card with 256 MB of RAM and DirectX 9.0b
- Windows XP + Service Pack 2/
Windows 2003 + Service Pack 1/
Windows Vista/ Windows Server 2008
- .NET Framework 2.0 + 3.0
- Windows Media Player 11

Windows Vista Media Center Plugin

Requirements:

- 1.5 GHz CPU, 256 MB RAM, 500 MB free hard disk, Video card with 256 MB of RAM and DirectX 9.0b
- Windows Vista Home Premium + Service Pack 1/ Windows Vista Ultimate + Service Pack 1
- .NET Framework 2.0 + 3.0
- Windows Media Player 11

Entertainment on the move – the FOKUS In-Car Media Client

FOKUS solutions pioneer the way towards a seamless service experience by overcoming platform boundaries. The next consequent step beside Media Clients for PC, Set-Top Boxes and Mobile Devices is the development and integration of IP and Internet based Rich Media Entertainment Solutions for premium automobiles.



Figure 4 - FOKUS In-Car Media Client

This FOKUS innovation answers to the name of “Mobile Car Service Platform” and offers a comprehensive offer in terms of IP-based Audio and Video Services for In-Car utilization. The Car-Client provides direct access to both Internet-Streaming-Services, *Musicload* and *Videoload*. The modular and plug-and-play like Client Framework allows a seamless integration into existing usage behaviors and fosters the next generation in Car-Entertainment experiences by enabling services as direct browsing, streaming and discounting of audio and video from *musicload* and *videoload*, access to user favorites, bookmarking, session continuity and many more.

Technology Outlook RIA IPTV – Silverlight and JavaFX Client

The past couple of years the term “Rich Internet Application” (RIA) has gained a lot of attention on the World Wide Web. With continuous increasing bandwidths and improved encoding algorithms, the technical

foundation for interactive multimedia experiences is in place and ready to go. IPTV is one compelling example for using the Internet to deliver a new user experience which differs from the classical web page browsing.

Nevertheless, facing a wide variety of browser, operating systems and devices, the choice for the right client application platform remains a crucial point when delivering interactive media content. The support for high definition video and the ability to reach mobile devices are only a two aspects of this challenge.

With Silverlight, Microsoft introduced a new RIA platform early 2007. With the release of Silverlight 2.0 in 2008, a new player beside Adobe entered the competition for rich user experiences. Although Microsoft constantly tries to avoid a direct comparison with Adobes Flash, the roadmap for Silverlight including the announced version 3 provides an interesting perspective for a new user experience inside the browser besides Adobe Flash. Supporting different browsers and operating systems, Silverlight has the ability to reach a wide range of users without the need for different software implementations.

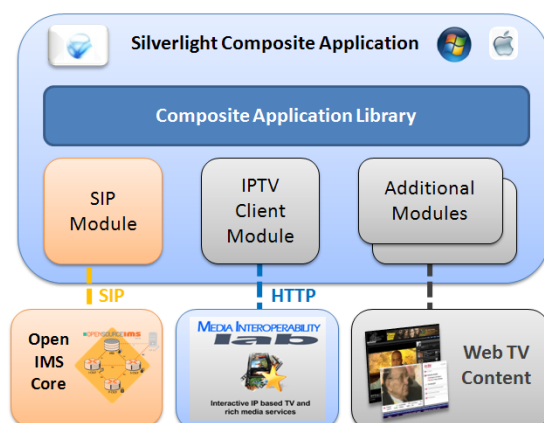


Figure 5 - Silverlight Framework

In contradiction Sun’s JavaFX RIA platform, which was initially announced to the public in summer 2007 and finally released in

December 2008 uses a certain different paradigm with regards to security issues and the usage of native (Java) libraries. The platform consists of the script language "JavaFX Script", which allows the development of applications with a high user experience, e.g. transparent overlays, integration of Java Swing Components and dynamic integration of Java libraries. Currently, the usage with Microsoft Windows and MacOS based systems is supported, but the support of Linux based systems is already announced by Sun. The JavaFX platform is delivered with the widespread Java Runtime Environment 6. Thus, a wide range of users will be reached.



Figure 6 - FOKUS JavaFX RIA IPTV Client

To serve the demand for these kind of services and end devices FOKUS decided to put effort on development of a RIA Silverlight and JavaFX IPTV & Telecommunication Client integrating TISPAN R2 & Open IPTV Forum R1 compliant IPTV signaling as well as NGN telecommunication services enabled by a Silverlight SIP stack and a Java based stack, respectively.

A modular approach allows the independent development of Silverlight modules supporting functionality like:

- Messaging
- IPTV

- Voice Calls
- Contacts & Presence

The foundation for these services is the implementation of a Silverlight-based SIP-stack. Because Silverlight does not allow the usage of external DLLs, a SIP stack must be compiled against the Silverlight runtime. Current .NET SIP implementations are targeting the full .NET framework and include features and namespaces which are not available in Silverlight. The framework for this client is the predecessor of the already successful Composite Application Block (CAL) namely the Composite Application Library (CAL). The following decision regarding client design have already taken and are under development:

• *Silverlight SIP Stack*

This module will provide the basic capabilities for SIP signaling using Silverlight. There are some restrictions regarding the supported transfer protocols (no UDP) and the program flow (no synchronous calls in Silverlight) which necessitate a revision of the current .NET SIP stack.

• *NGN Module*

Using the SIP Stack this module enables the application to communicate with the NGN core network. A simple user interface to test basic functionality like user registration should be included.

• *SIP / General Logging Module*

For debugging reasons a simple logging module with extended capabilities regarding SIP debugging will be developed. It should provide a simple graphical user interface to debug possible error messages and a small SIP message viewer. It will also provide a wrapper for other logging frameworks like log4net which cannot be used directly in Silverlight.

• *Unit-Test Module*

There are already some implementations of Silverlight based Unit Tests, especially designed to provide unit tests for the Silverlight Toolkit, a community based collection of advanced controls. This module will apply these testing best practices to create basic test cases for the IMS Module, which can be run without extensive user interaction.

• *Voice Calls*

The current Silverlight 2.0 implementation does not support microphone input or video capture. Facing this limitation a voice call module cannot be implemented using Silverlight 2.0.

• *IPTV Client*

A MS-Silverlight module enables basic ETSI TISPAN IPTV functionality and HTTP streaming within the browser.



Figure 7 - RIA IPTV Client

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