Mohamed **Azzouni**

Senior Embedded Software Engineer · Set Top Boxes - Security - DRM - Streaming - OTT - Android

rue Jesse Owens , Saint Denis

0033 (0) 699879354 | mohamed.azzouni@gmail.com | mohamedazouni

Skills

Programming	C, C++, JAVA, PYTHON, PERL, SHELL , Makefiles, HTML, PHP, XML, Javascript
Versioning	CVS, SVN, Clear CASE, RTC, JENKINS, GIT, MERCURIAL, Bitbucket
Web & OTT	node.js ,dash.js , angularJs (2 & 4) , shaka player , Packet Video, GUPNP, Lib Platinum, WSDL, REST, SOAP
J2ee & DB	Java Jersey Rest , J2ee , Spring , Mongo db , Hbase
others	Agile, Android: NDK/SDK/JNI, STB:Middleware & Drivers, HDCP, MPEGDASH, HLS , VOD, OTT,Playready, UPNP
Languages	Arabic, French, English

Education

ENSI(National School of Computer Sciences of Tunis) *Tunis, Tunisia*

Engineering degre in Computer Science *2004 - 2007*

speciality in open systems and networks

Experience

EXPWAY *PARIS , France*

Linux/Android Development Engineer *Jan. 2018 - PRESENT*

- Development of Solution for Public Gateway EMBMS Live Services WIFI multicast
- LTE eMBMS (evolved Multimedia Broadcast Multicast Service) are used to drive live multicast service to end userphones.
- An LTE Outdoor unit is connected to a Gateway, the soft to be developed will be deployed on PG to activate dash live services and forward multicast packet to WIFI.
- based on Expway Libarary a service will be developped and installed as daemon onBroadcom based public Gateway
- **Environment :** Modem AT-Command, Broadcom ,Gateway, WIFI, Multicast, dash, EXPWAY Middleware , redmine , C, C++, Android

SFR-Numericable *Saint-Denis , France*

Software DRM/HDCP Engineer *Feb. 2016 - Jan. 2018*

- Integration of Netflix nrd 4.3 within new 4K STB .
- Concept and develop a library HDCPmanager that provides interface to manage hdcp link in 1.X and 2.x protocole versions.
- Concept and develop a library DrmManager that provides interfaces to manager Playready 2.5 and eventually Widevine for SFR new Box used for VOD playing
- Concept and develop a library that will install provisioning Data on STB : On factory for SFR new Box (data : Nagra, HDCP, DRM and SFR keys)
- Integration of STMicroelectronics PlayReady SDK in SFR Set Top Boxes products
- Developing a library interface of STM PlayReady SDK , to be used by SFR Middleware on Set Top Box .
- **Environment :** STB, STM, Broadcom , Middleware WYPLAY, MW SFR , C, C++, PlayReady 1.2/2.5,TEE, Gentoo, mercurial, Git
- **References :** Sbastien Keller(SFR), François Delavaud , Anouar Chelbia (SFR), Vishal Sharma (Netflix)

Netflix integration *Aug. 2014 - Jan.2016*

- Integration of Netflix Partner Client Code in Middleware code on Set Top Box Based on 7105 Chip of STM.
- Porting some parts of Netflix client code (audio and video driver and some Direct FB code) to work on 7105 based Set Top Box
- Realization of automatic Netflix tests and certification
- Monitoring with Netflix partner via weekly conferences calls between team in US and France and daily coordination integration
- **Environment :** STM, MW SFR , C, C++, PlayReady 1.2, DirectFb ,TEE, Gentoo, mercurial, Git
- **References :** François Delavaud , Anouar Chelbia (SFR), Vishal Sharma (Netflix)

Bouygues télécom

Vélizy-villacoublay , France

Software integration & developping Engineer — *Feb. 2014 - Jun. 2014*

- Development of software module that use a cloud client (based on PogoPug Fuse solution); So the user could connect , mount and use his pogo cloud files on her STB
- Development and integration of Media Center new features on Middleware.
- **Environment :** STB, Middleware Sagem ,Product Bouygues Sensation Box , C, C++, Linux, UPNP, DLNA, POGOCLOUD Cloud, Fuse File system, PacketVideo
- **References :** Sandrine Figard (Bouygues telecom), Majed Jabri (Bouygues telecom)

Architecte STB for PVR Sharing Service — *Jun. 2013 - Jan. 2014*

- Writing of SSA (Software Specification Architecture) of service STB PVR sharing (PVR: Personnel Video Recording) : secured solution based on Protocol HLS to play STB recorded movies on LAN and WAN devices ; records will be transcoded , segmented , encrypted and served to clients).
- Writing of STS (Software tests Specifications) of PVR Sharing service on STB part of Service.
- **Environment :** STB, Middleware Sagem, LibPlatinum, C, C++, Linux, UPNP, HTTP, HTTPS,SSL
- **References :** Nicolas Gaude (Bouygues telecom), Jabri Majed(Bouygues telecom)

Software Enginner — *Sep. 2011 - May. 2013*

- Develop Web Services STB Export module that will export multiple STB features (Remote Control, Pairing, PVR, EPG ..) via HTTP Rest and UPNP.
- Develop STB DMR : module proposing DLNA DMR service UPNP and HTTP Rest.
- Develop MediaPlayer : module STB, for mixed playlist media managements
- Develop Receiver Expo STB : module that serves as a asynchronous full duplex communication library between the Middleware and Web Services Export Binary
- Develop PfsProxy : module on multiple platforms (STB, Android and IOS) of for connection and communication with Bouygues platforms (EPG, PVR, OAuth, Smartvision ..) with automatic authentication tokens management.
- Develop DMC : module on multiple platforms (STB, Android and IOS) it's a UPnP control point
- Development of a Native Middleware on Android (NDK / C / C ++ / JNI / JAVA and JAVASCRIPT) composed from DMC, DMS and PFSPROXY : JNI , JAVA and JavaScript Layers for each library ..
- **Environment :** Middleware Sagem, STB, C, C++, Java, JNI, JavaScript, Android, Linux, UPNP,DLNA, SOAP, REST, LibPlatinum...
- **References :** Nicolas Gaude (Bouygues telecom), Jabri Majed(Bouygues telecom), Pascal Souveaux(Bouygues telecom), Joël Motoumassy (Bouygues telecom)

NDS-CISCO

Issy les Moulineaux, France

Consulting Engineer — *March 2010 - Aug. 2011*

- Development and integration of a module within Middleware STB ; it's a MediaCenter module that allow the sharing and control of medias over networks via Upnp/Dlna Protocol.
- DMS (Digital Media Server) solution is Twonky from PacketVideo company
- Development of a module in C for control and management of the Twonky server via RPC and for sharing FTA PVR and media content from USB drives connected to the STB
- Development and JAVA JNI layer of the module to be exploited later by the UI in JAVA
- **Environment :**Middleware MHP de NDS-CISCO, languages C and JAVA, Shell, Makefiles, UPNP, PV Twonky API, PV Twonky Server.
- **References :** Hassen Taleb (NDS-CISCO) , Eric Delaunay (NDS-CISCO)

Sagem Défense

Massy-Palaiseau, France

Software Engineer Development — *Dec. 2009 - Feb. 2010*

- TMA : Third Maintenance Application of Network Server System on aircraft Airbus A380
- **Environment :** C, C++, Java, Perl, Python, SGBD MYSQL, Linux ..

Eurogiciel

Tunis, Tunisia

Software Engineer — *May. 2009 - Nov. 2009*

- Design and implementation of an application that manage a Switch via i2C in the NSS (Network System Server) for the Airbus A380
- The PSM, interfaces with LDAP, VPN, an I2C interface to control the Switch and a Flight switches.
- Test are automatized in virtual environment using Perl scripting and shared memory C programs .
- **Environment :** C, tested and integrated under Linux FreeBsd 5.3. , perl ..

STMicroelectronics *Tunis, Tunisia*

Set Top Box Low Layer development Engineer, *Out. 2007 – Apr. 2009*

- Engineer in STAPI (ST-API) team : responsible for development, maintenance and support for VOUT (Video Output Stage) and HDMI (High Definition Multimedia Interface) drivers for STM socks.
- Bug fixing and support for various clients.
- Porting of drivers code on new chips and update documentation of drivers for new socks
- **Environment :** C, OS21, STLinux, Clear Case, socks: ST7100, ST7109, ST7200 et ST7105.

Personal Projects

it's a private project on bitbucket, it still on going

BitBucket Project Link

Realization of FJ Streaming Engine — *Jun. 2012 - PRESENT*

- The FJSE is three part project, containing : j2ee rest java server with a mongodb Database called FJServer, a AngularJs 4 Server UI called FJUI and a html 5 Js dash player called FJPlayer :
  - FJServer :
    - The FJServer will upload video content , transcode it(using ffmpeg) to 5 bitrates h264 video (from 360kb/s to 4500kb/s) and 3 bitrates aac audio(from 128kb/s to 450 kb/s , then dash and encrypt it using Bento4 framework for vod and Googlepackager for Live (packaging is done wi python scripts and CENC clear key is used). once done , the movie is available to FJSE client to be streamed as dash protected content .
    - this FJServer is used by manager user to connect using oauth2 protocol (login/password), than he can upload medias and define streams, slso define app or web site allowed to access this stream , once dashed streams will be availables to allowed app or web sites for streaming
  - FJUI :
    - it the Server Angular 4 UT , which allow User to connect to FJServer , define stream and upload movies or define live streams , user also can define app/webSite that are allowed to use his streams .. streaming
    - The UI contains also a dashboard that presents statistics about streams regarding number of watches , clients IP ..
  - FJPLAYER :
    - The FJPlayer Html 5 Js player based on Video Balise
    - The FJPlayer also is based On Dashjs player
    - Once we ask to play a media content on website , the player will ask the encryption key of the media presenting the web site AppID, then get the mpd and start streaming , decrypting and playing..

Easy UPNP

Easy Upnp on Google Play Link

Realization of an android application — *Nov. 2012*

- The applicartion is an upnp control point wthat allow to discover and control upnp devices on a lan network.
- This app was completly developpend with Java code.
- This app also contains advertissment , it's done with google AdsMob..
- This app is no more maintained