

MarkScan

India | New Delhi

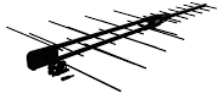


Digital Forensic Analysis - *Pagaria S6060 DVB*

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- **Transmission of TV channels - India**
 - Technical Analysis of Pagaria S6060
 - Expense & Revenue Model Pagaria S6060
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Television broadcast in India happen through Terrestrial transmission, DTH, Local cable & IPTV

Television Broadcasting Types in India



Terrestrial Transmission

- Terrestrial television is a type of television broadcasting in which the television signal is transmitted by radio waves.
- Only Free to Air channels can be run through terrestrial transmission



Free & Paid DTH

- DTH stands for Direct-to-Home and transmission of TV channels in this mode happens through satellite
- There are two types of DTH service provide – Free (i.e. DD Dish) & Paid DTH (i.e. DishTV)
- Free DTH can run FTA channels whereas paid DTH offers paid & free channels



Local Cable

- Transmission of TV channels for local cable operators also happen through satellite.
- TV channel broadcaster transmits signal on a satellite which is downlinked by a multi-system operator (MSO) through special set-top-box as per downlink parameters.

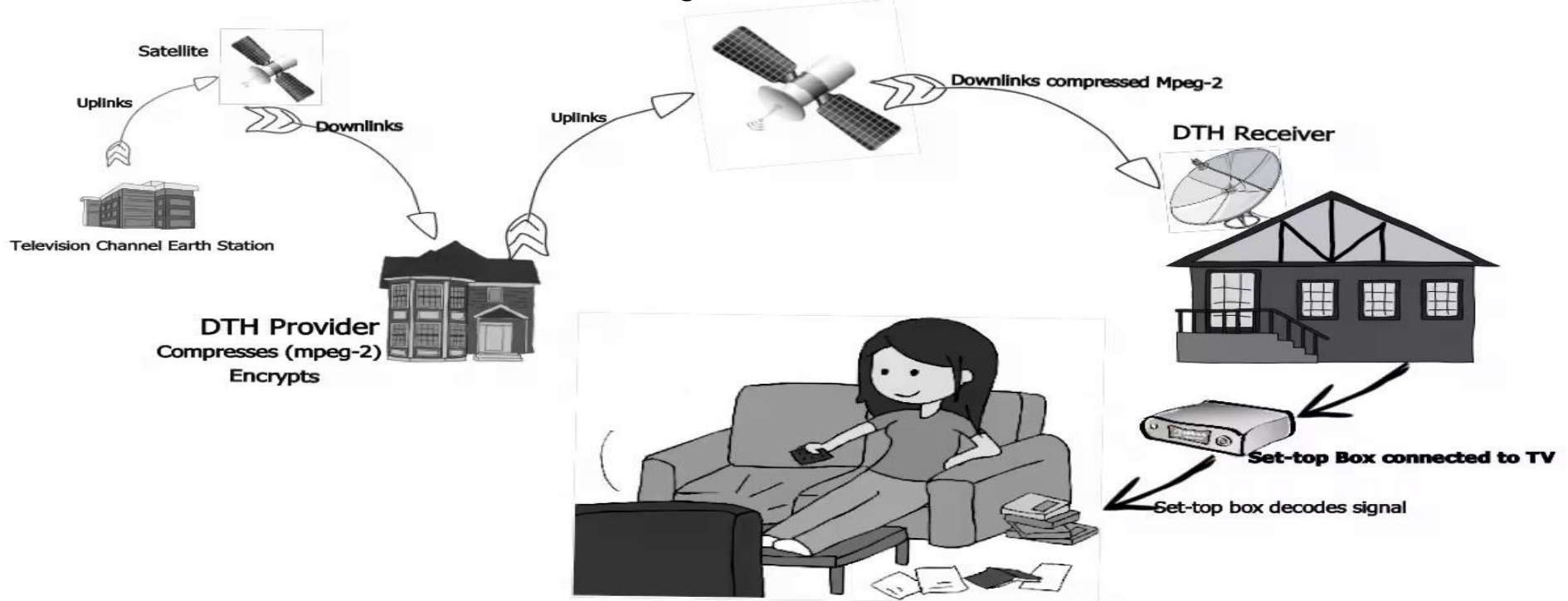


IPTV

- IPTV stands for Internet Protocol Television
- The transmission of content happen over the Internet
- Currently, this segment is evolving as Internet speed is evolving in India.

Broadcast transmit TV channels to DTH provider and they encrypt & transmit content to end consumer

Working of Paid DTH service



1. TV channel broadcaster uplink content to satellite
2. DTH provide downlink content from satellite
3. DTH provider encrypt pay channels using CAS (conditional access system) & uplink the content
4. DTH receiver at customer end receives (downlink) the pay channel signals & STB decrypt the signals with DTH card installed in STB.

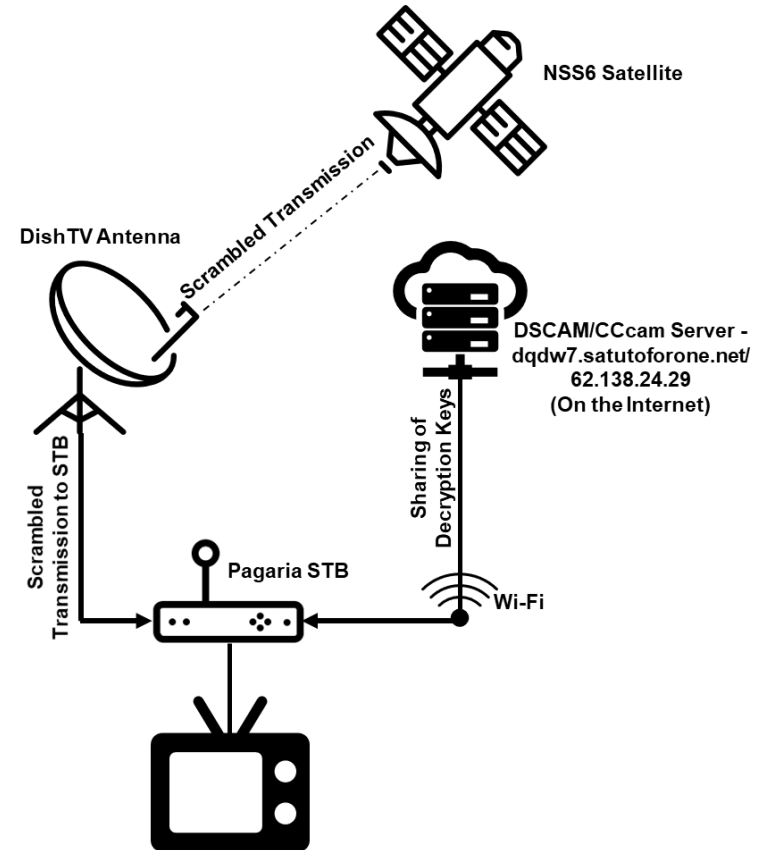
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The Pagaria S6060 provides pay channels and works on Dual Technology – *Satellite Transmission & DSCAM server*

Indian Paid Channels in S6060



Network Diagram – S6060



Note1: CCCAM (Client Card Conditional Access Module) & DSCAM both are same technologies which works on “cardsharing” technology.

Note2: Please refer to Appendix “A” for more details on CCCAM/DSCAM server

We captured DishTV broadcaster fingerprints appearing on TV channels playing through Pagaria S6060

Broadcaster Fingerprint - DishTV



Channel Name: Star Bharat
FP ID: 00113FAB



Channel Name: Star Gold
FP ID: 00113FB3

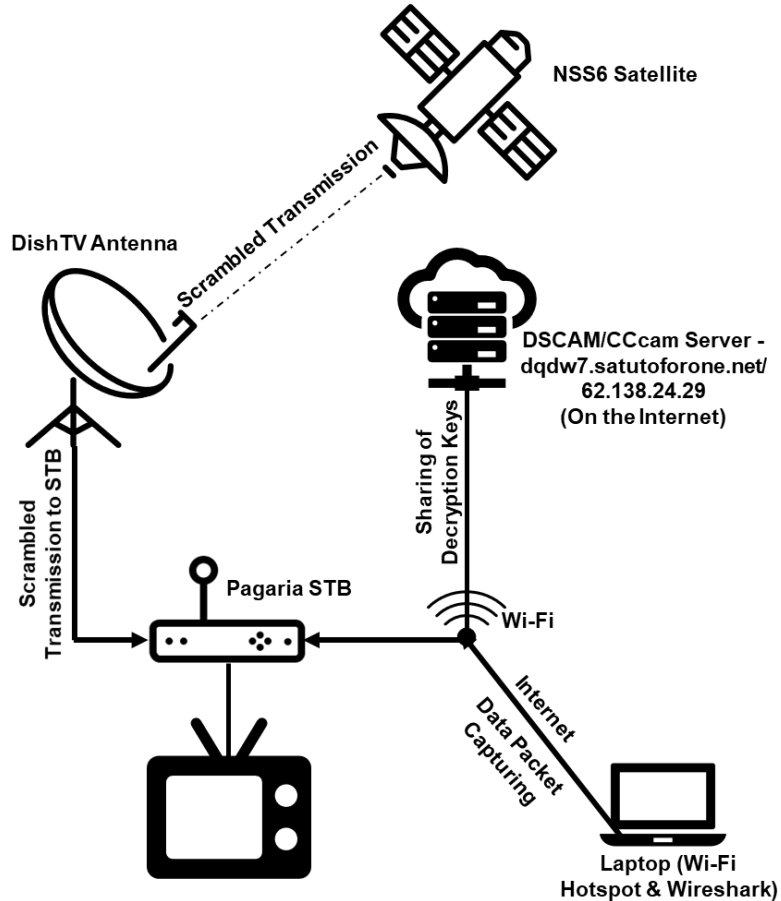


Channel Name: Star Plus
FP ID: 00113FAF

Note: These FPs were captured on 17th April 2019 at 17:01 hrs

We have identified the DSCAM server providing decryption codes via intercepting the communication between STB & DSCAM

Technical Analysis – S6060



Monitoring of Wi-Fi Hotspot - Wireshark

Npcap Loopback Adapter
Local Area Connection* 11
Local Area Connection* 10
Wi-Fi
Bluetooth Network Connection
Local Area Connection* 2
Local Area Connection* 12
Local Area Connection* 4

Intercepted Data Packets - Wireshark

Capturing from Local Area Connection* 2

No.	Time	Source	Destination	Protocol	Length	Info
1040	374.421741	192.168.137.251	62.138.24.29	TCP	100	1024 → 23000 [F
1041	374.597037	62.138.24.29	192.168.137.251	TCP	66	23000 → 1024 [F
1042	375.441308	192.168.137.251	62.138.24.29	TCP	100	1024 → 23000 [F
1043	375.613996	62.138.24.29	192.168.137.251	TCP	66	23000 → 1024 [F
1044	376.461843	192.168.137.251	62.138.24.29	TCP	100	1024 → 23000 [F
1045	376.639924	62.138.24.29	192.168.137.251	TCP	66	23000 → 1024 [F
1046	377.481364	192.168.137.251	62.138.24.29	TCP	100	1024 → 23000 [F
1047	377.653203	62.138.24.29	192.168.137.251	TCP	66	23000 → 1024 [F
1048	378.501990	192.168.137.251	62.138.24.29	TCP	100	1024 → 23000 [F
1049	378.673497	62.138.24.29	192.168.137.251	TCP	66	23000 → 1024 [F

Note: Please refer to Appendix B for Internet eco-system details of DSCAM server

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- Transmission of TV channels - India
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 - **Revenue Model Pagaria S6060**
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To run such kind of setup, ~10-20k investment is required and pirates are earning revenue by sale of box & subscriptions

Expenses - Estimates

- **DTH Box/Card** – The pirate would have a valid DTH card which they will use in for the decryption the codes. A onetime installation cost (~₹1500) and monthly SD channels subscription would will required which is anywhere around ₹300-400 per month.
- **Dreambox** – The DVB STB device that would cost around ₹2500-3500. This device will be connected to the DSCAM server via Internet and will be uploading the decryption codes on the server in real time.
- **Internet** – A monthly 4Mbps Internet will cost them around ~₹500-1000. They won't need high speed bandwidth network as the system is only uploading the decryption keys
- **Server** – A medium scale server from host Europe would have costed them around ₹3000 per month.
- **Domain Name** – The domain name (satutoforone.net) would cost around ~₹300-600 per year.
- **STBs & Customization of STBs Firmware** – The STB Firmware are generally made by manufacturer, however the customisation of it can happen at either at manufacturer level or the pirates would load the Firmware post manufacturing of boxes. The manufacturing cost of such boxes is anywhere between ₹200-₹300 and one-time cost of customization of firmware (to include DSCAM server details) would be estimated around ₹1500-3000.
- **Marketing** – These boxes are generally marketed via social media platforms so we expect that marketing for such boxes will cost them ₹5000-₹10000 per month.

Revenue - Estimates

- **Sale of box** – The box is available in market anywhere from ₹1000-2500 and user would need to pay one-time fees and will get 1-year subscription
- **Subscription Model** – The subscription is anywhere between ₹300-600 per year for DSCAM/CCcam server.

Note1: These details are basis preliminary information available on the Internet

Note2: Full guide to setup DSCAM/CCcam technology:
<https://sites.google.com/site/ocbfreeservers/cardsharing-tutorials-tools/beginners-guide-to-successful-cardsharing>