



RVU Alliance Update: DTCP-IP protection for 4K / Ultra HD services

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*FCC Downloadable Security Technical Advisory Committee
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- DTCP+ not in MovieLabs enhanced content protection specification
 - Possible reasons include: robustness rules not adequate, minimal enforcement of compliance, revocation not adequate, and renewability not considered
- DTCP+ has important benefits, however
 - DTCP+ encryption and authentication protocols are vetted and considered strong
 - DTLA, which manages licenses and issues DTCP certificates, is a trusted entity. Sony Pictures, WB and Disney are all “content participants” in DTLA.
 - Approved by DLNA, RVU Alliance, CableLabs, FCC...
- “Alternative DTCP-IP Digital Output” addresses all requirements
 - Client devices authenticated by RVU server
 - Only those clients listed on the RVU server Whitelist receive high value services
 - Upgradability using clients’ own broadband-based mechanisms, and/or using an optional RVU mechanism via LAN from RVU server, to ensure continued high value services
 - Whitelist management (device approval, revocation and renewal) follows content agreements between RVU server provider and programmers

- Enhanced device robustness requirements
 - Equivalent or greater than that required of HDCP 2.2
 - State-of-the-art security tools including secure media pipeline, secure processing environment, protected memory, and chain of trust for code
- Client device compliance requirements
 - Outputs only via HDCP2.2 protected output
 - Method for delivery of software update packages
- Approved Cryptographically Secure Mechanism
 - Client device information protected in integrity and passed to RVU server
 - Information includes DTCP device ID, Manufacturer ID, Model ID & Software version
- Whitelist
 - Client device information validated against whitelist of devices authorized by content licensors for reception of their high value content
 - Addition / removal / reinstatement of devices on whitelist managed by RVU server provider

Whitelist Management



RVU
Client B



RVU
Client C



3

1. Client info securely passed to server
2. Server validates against whitelist of devices
3. Whitelist managed by server provider per agreements with content owners
 - Addition = device approval
 - Removal = device revocation
 - Reinstatement = device renewal (e.g. SW upgrade)



- RVU Alliance updates
 - Guideline modifications added “RVU 4K UHD Client Authentication Protocol”
 - Certification program additions
- Device upgrades
 - DIRECTV Genie server upgraded via secure software download mechanism
 - Whitelist client device info provided by TV manufacturers

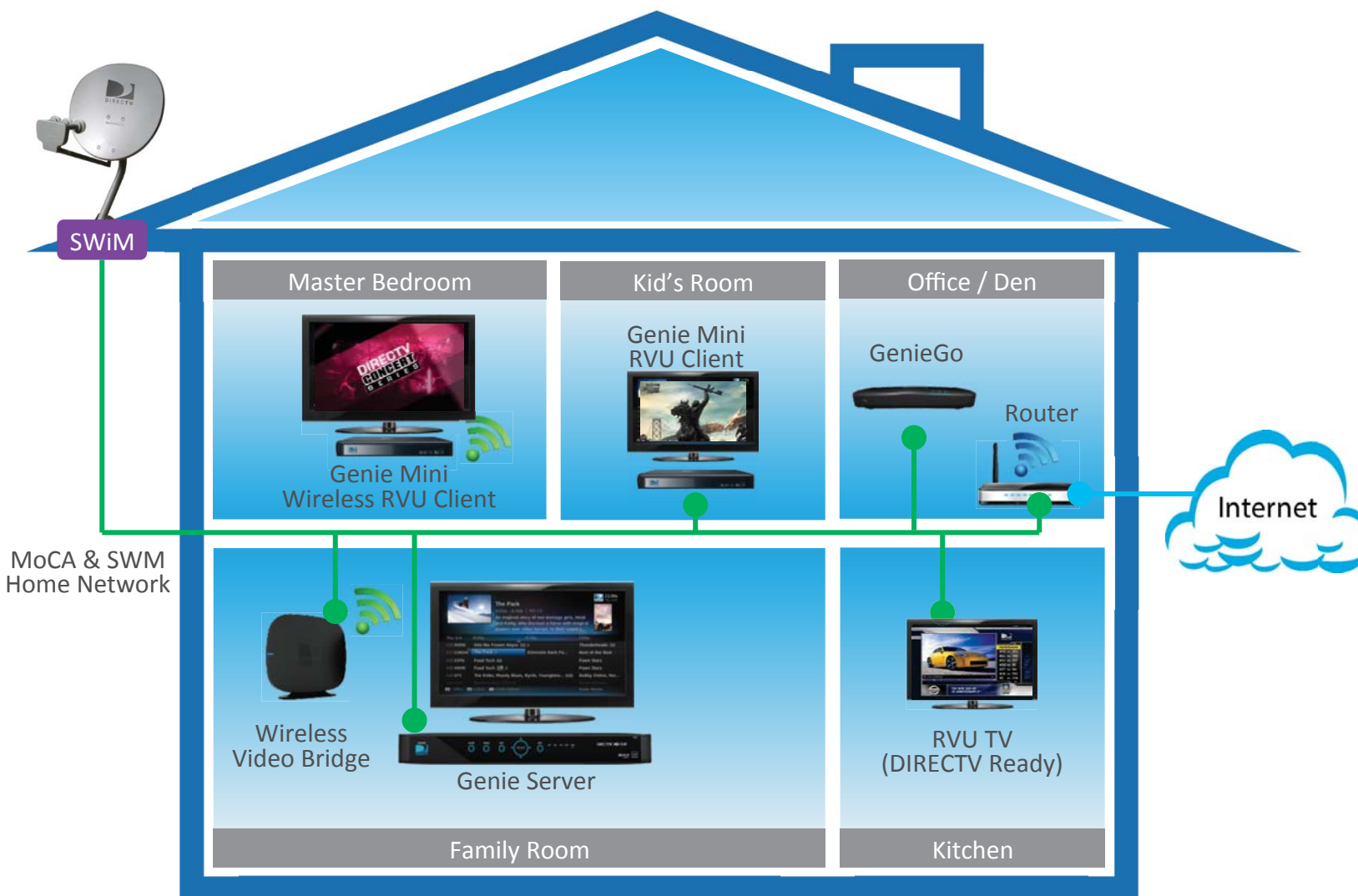


(Backup slides follow)



Thank You!

DIRECTV Genie Architecture (since 2013)



- **RVU Remote User Interface** allows full HD-DVR experience on every TV
- **IP-based** = works with both Wireless and Coax networks

RVU Remote User Interface (RUI)



- Full DIRECTV experience without a STB at every TV
 - Reduces costs, saves energy
- Industry standards increase adoption by TV manufacturers
 - “DIRECTV Ready” logo allows co-marketing programs
- Since TV decodes video, can deliver new 4K services
 - Streamed from Genie



HDMI



Remote UI Server

UI rendering info

User input

Network
(wired or wireless)



Remote UI Client
(RVU software in TV)

User input



- First MVPD to Deliver 4K Ultra HD VOD to Customers' Homes
 - Launched November 2014
 - 4K Ultra HD titles are delivered via satellite, recorded to the Genie HD DVR and streamed via home LAN to ensure the best playback experience
 - 8 Million homes require no DIRECTV upgrade (growing by ~1M each 3-4 months)
 - First compatible TV models from Samsung with others expected in 2015

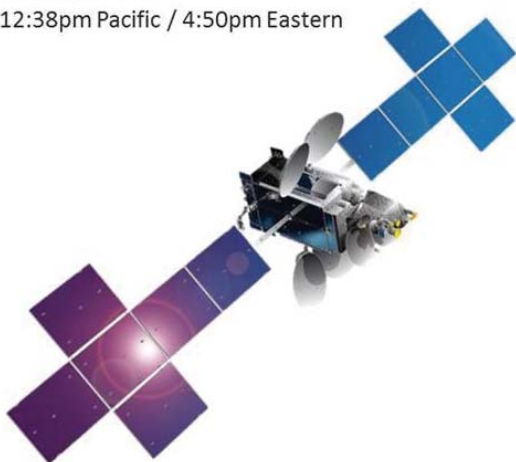


<http://www.directv.com/technology/4k>

D-14 Satellite Launch on Ariane 5

4 Dec 2014 D-14

12:38pm Pacific / 4:50pm Eastern



- Capacity expansion underway to support future 4K linear services
 - Dozens of channels
- DIRECTV-14 (December 2014) and DIRECTV-15 (May 2015) satellites launched
 - Use new FCC allocated frequency bands known as “reverse band”
- New channel-bonding receiver front end tuners required to support linear 4K data rates
 - New DIRECTV Genie servers beginning 2015 have this ability