



FALL TECHNOLOGY SERIES

Smart TV

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An overview of Smart TVs

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What we're going to cover

- Description of smart TV functionality and the smart TV ecosystem
- Highlight some of the consumer protection issues around smart TVs
- OTECH look at smart entertainment devices in the lab



What is a smart entertainment device?

- Something that enables internet connectivity on a large screen format
 - Over-the-top (“OTT”) content
 - Interactivity
- Widespread streaming video content over internet available at least since mid-2000s
 - Gaming consoles among first to bring to TV



Potential benefits of smart TVs

- Access to more and more diverse content on a big screen
- Interactive programming
- Personalized recommendations
- Alternatively:
 - Fewer commercials
 - If ecosystem becomes more ad-supported, potential for lower prices



Data collection on smart TVs

- Delivery
- Research and product improvement
- Measurement and ratings
- Advertising
- Cross-device tracking



Tracking on smart devices



Smart TVs



Smart TVs



Cable providers



Cable providers



“Addressable TV”



Smart peripherals



Applications



Aspirational Lumascape for Smart TVs



What can be collected?

- How to keep state on users?
 - Cookies? Device IDs? IP address?
- Viewing habits
- Voice/camera
- Other nearby devices
- Tie TV viewing to offline data
 - Demographic targeting
 - Attribution
- Data minimization efforts
 - Deidentification/aggregation techniques
 - Data retention limitations
 - User controls



Cross-device tracking

- Also interest in linking smart TVs with other networked devices
- Useful for:
 - Seamless experience
 - Retargeting
 - Purchase attribution
 - Broader behavioral profile
- Can use probabilistic or deterministic methods
 - Probabilistic based on likely shared characteristics (IP)
 - Deterministic based on real-world identifier (email, ultrasonic code)



Transparency and controls

- What are consumer expectations for smart TV privacy?
- How message to consumers?
 - Privacy policy?
 - Stand-alone notice?
 - Standardized notice like AdChoices icon?
- Are there consistent cross-app (or cross-platform) controls?



Security

- Do smart devices get security updates? How regularly? For how long?
- Threat models
 - Can attack the TV/device (Is traffic encrypted?)
 - Can attack other networked devices
 - Can be leveraged to attack others (*e.g.*, DDoS)
- Long-standing area of interest to FTC
 - IoT report
 - 6(b) study of security updates to mobile phones



How long are applications supported?



Legal framework

- Section 5 of the FTC Act
- COPPA
- Cable Act and Communications Act
- VPPA
- ECPA



Our study

- Looked at disclosures, data flows, and controls for three different smart TVs



Transparency and control

- All platforms reserved broad rights to monitor viewing habits
- Defaults always in favor of collection for targeting, but interfaces varied
- All offered controls for device-level targeting, but we didn't always see a mechanism for controlling third-party apps (and their third parties)



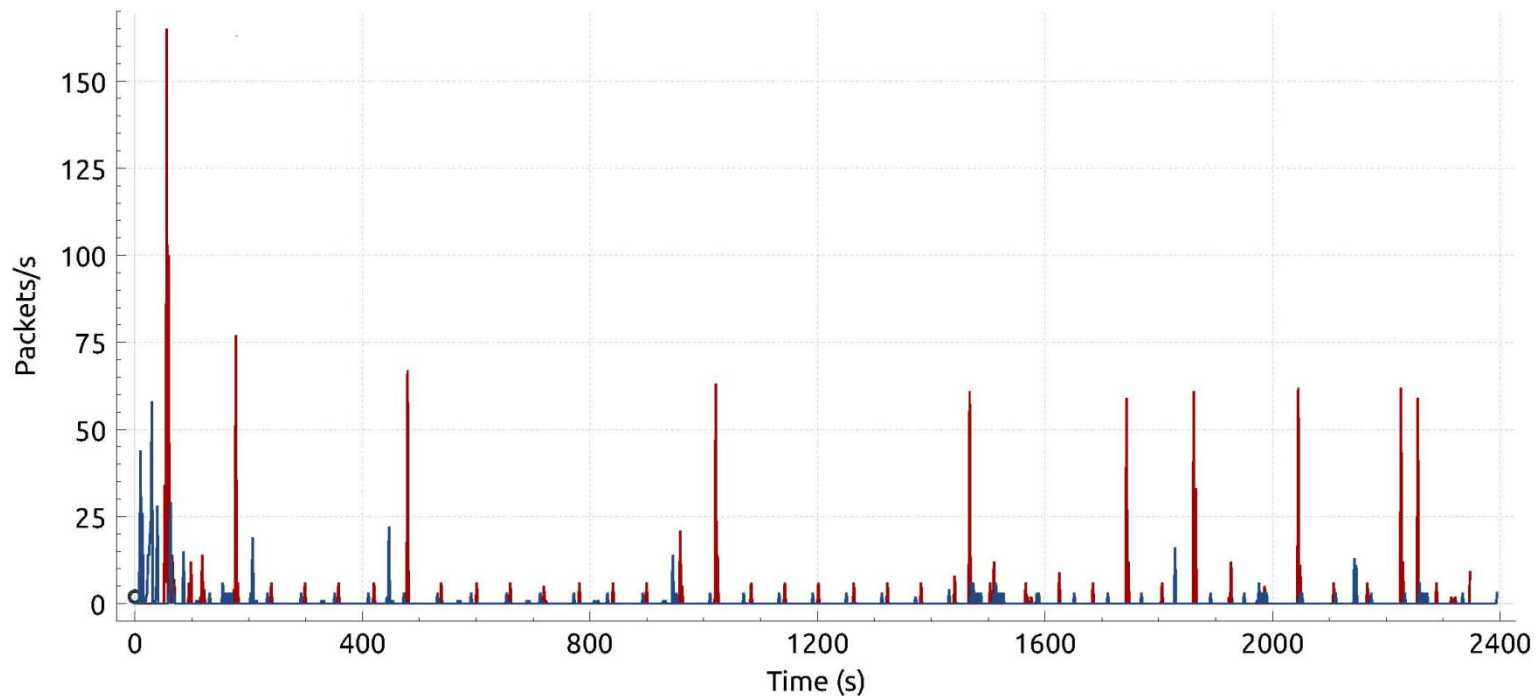
Data collection

- Third-party data sharing not as widespread as on web or mobile
- On two of the three TVs, regular encrypted communication with manufacturer's servers
- The other TV reserved broad rights, but manufacturer did not appear to engage in regular data collection
- Available controls seemed robust
 - One TV ceased all regular communication, other reduced to minimal traffic



Our findings

- Communications between Smart TV and “acr” server during DVD play



Data collection

- Apps did communicate with third parties on the smart TVs
 - But typically considerably fewer third parties than see on web or mobile
 - One app we looked at connected to more third parties on the TV than either web or mobile
- Did not see controls on how to limit *app* data collection and sharing practices
- Most app and third party traffic was encrypted
- Often used cookies to keep state on users
 - Possibly because less standardization of device identifiers than on mobile



The future

- Still early days
- May see more data collection if more standardization, more viewing over IP
- Will robust cross-app (or cross-platform) controls emerge? What self-regulatory models will develop?
- Will consumer expectations evolve? Will privacy add-on tools emerge (like we've seen with ad- and tracker-blockers)?
- Pay-for-content or ad-supported?



Panel 1: New Frontiers in Media



Panel 2: Consumer Understanding

