VideoGuard Everywhere Anti-Piracy

Video Service Provider Security Product
January 2018

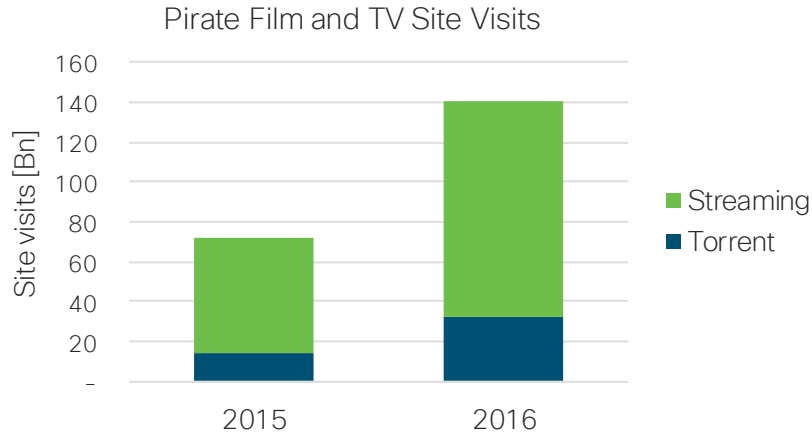# Outline

The State of Piracy

The IP Effect: Online Video Piracy Is Growing

Video transformation to IP network infrastructure and connected devices drives adoption of online video – both legal and illegal

User visits to piracy sites grew 129% between 2015 and 2016

Pirate Film and TV Site Visits

Site visits [Bn]

- Streaming
- Torrent

2015   2016

Source: MUSO global sample piracy reports

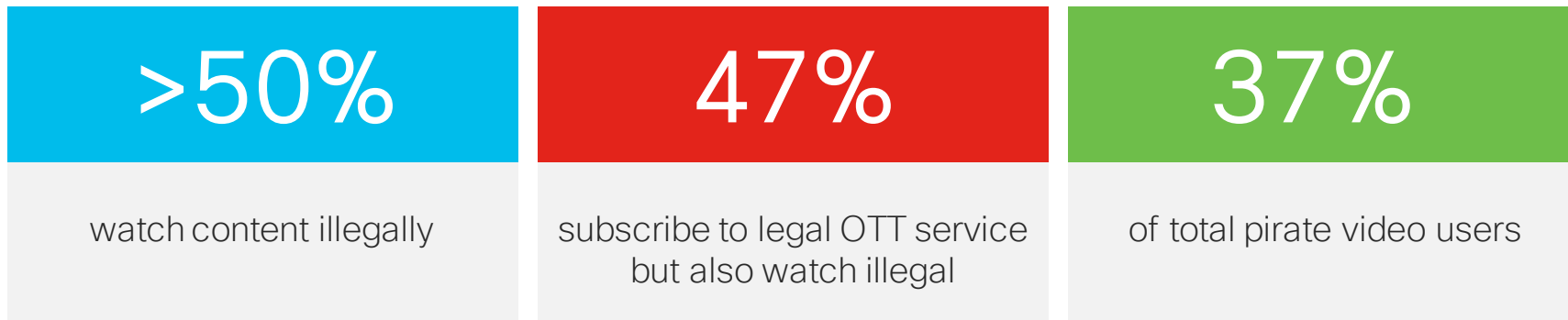## Kodi, which simplifies the illegal streaming experience, grows in popularity

- 40 million active users

- UK: 13% of infringers

- N. America: 68.6% of HH that have a Kodi device (8.8% of HH population) access unlicensed content

Kodi Households Accessing Unlicensed Content Using Unofficial Add-ons

68.6%
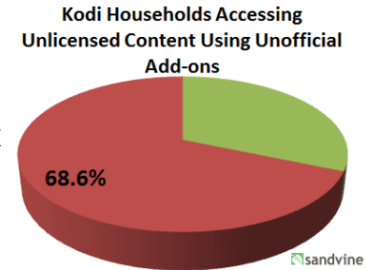
sandvine

Sources: ABI Research, Sandvine, UK Government

Starting with Millennials, Streaming Piracy Can Become a Social Norm

Streaming piracy is prevalent among younger generations (18–34)

>50%	**47%**	**37%**
watch content illegally	subscribe to legal OTT service but also watch illegal	of total pirate video users

Piracy habits are likely to continue as this young generation matures

- Even when they earn more, their reference point is free/freemium Internet economy rather than paid media for previous generations
- They already have the technical know-how to access illegal services

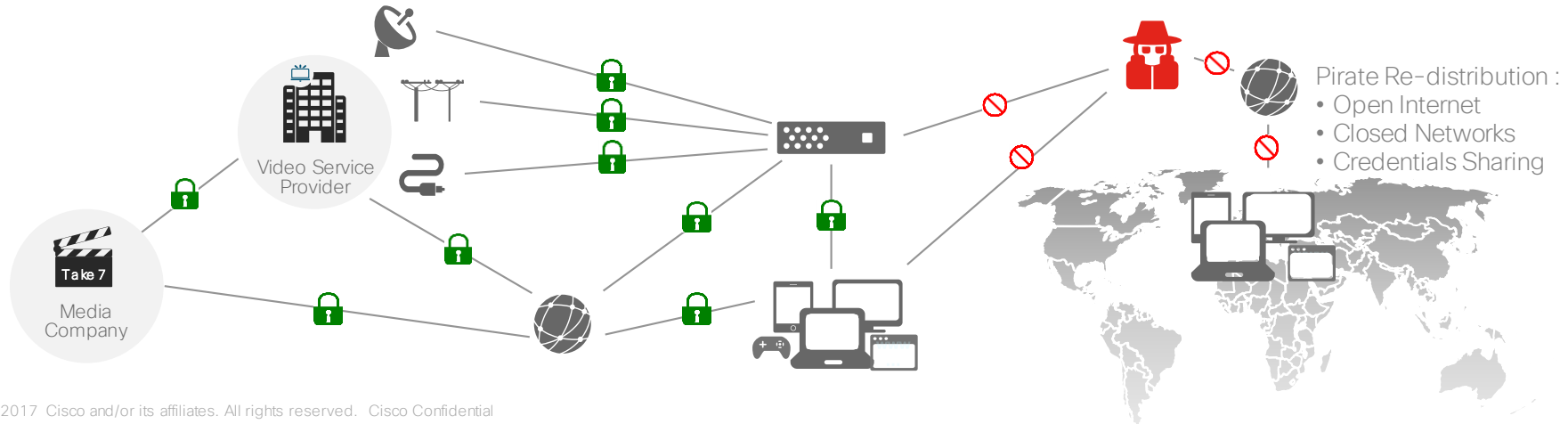# Video Piracy Is Moving to Online Redistribution

Pirates leverage Internet infrastructure, enjoy global reach, 80% profit margins!

From traditional piracy

- **Attack:** hacking video access controls
- **Monetization:** selling fake smartcards, key sharing
- **Security measures:** CA/DRM

To online piracy

- **Attack:** grabbing & redistributing video output from devices
- **Monetization:** offering pirated content on IP-STB/app/web
- **Security measures:** piracy detection & response

Pirate Re-distribution :
- Open Internet
- Closed Networks
- Credentials Sharing

Video Service Provider

Take 7

Media Company

Video Streaming Piracy Poses a Tough Competition

- ## Taiwan: piracy site visits > 8 x legal site visits
  According to Ministry of Economic Affairs, in May 2017 the top five pirate sites registered more than 64 million visits and 564 million page views while top five legitimate video websites in Taiwan logged more than 8 million visits and 25 million page views.
  Source: S&P Global

- ## LATAM: pirate pay-TV can be positioned as the 3rd largest player on the market
  With 7% household share behind América Móvil and DirecTV. In Argentina
  Source: Dataxis

- ## Mayweather-McGregor fight: pirate views in US > 10 x legal pay-per-view in US
  VFT tracked 51.66 million views in USA (out of 123 million globally) on Facebook Live, Periscope, and Youtube Live, dwarfing Showtime's stated estimate of 4.6 million paid views in USA.
  Source: Forbes

- ## Game of Thrones 7th season opener: piracy views > 5 x legal site views
  It was pirated 91.74 million times, 85% of which by online streaming, with US, UK and Germany leading piracy viewership. In contrast, legal viewership on HBO amounted to 10.1 million viewers for linear, and another 6 million viewers for same-day DVR playback and streaming via HBO Go and HBO Now.
  Source: MUSO monitoring, Hollywood Reporter

Credentials Sharing Piracy: $10B Problem by '21

Video service providers are concerned about credentials sharing

"There's lots of extra streams, there's lots of extra passwords, there's lots of people who could get free service."

Tom Rutledge, CEO

"The more the practice is viewed with a shrug, the more it creates a dynamic where people believe it's acceptable. And it's not."

Justin Connolly, EVP

PayTV revenue loss due to password sharing is expected to almost triple in the next 4 years

Swapping Sign-Ins
Password sharing seen costing the U.S. pay-TV industry nearly $10 billion in four years
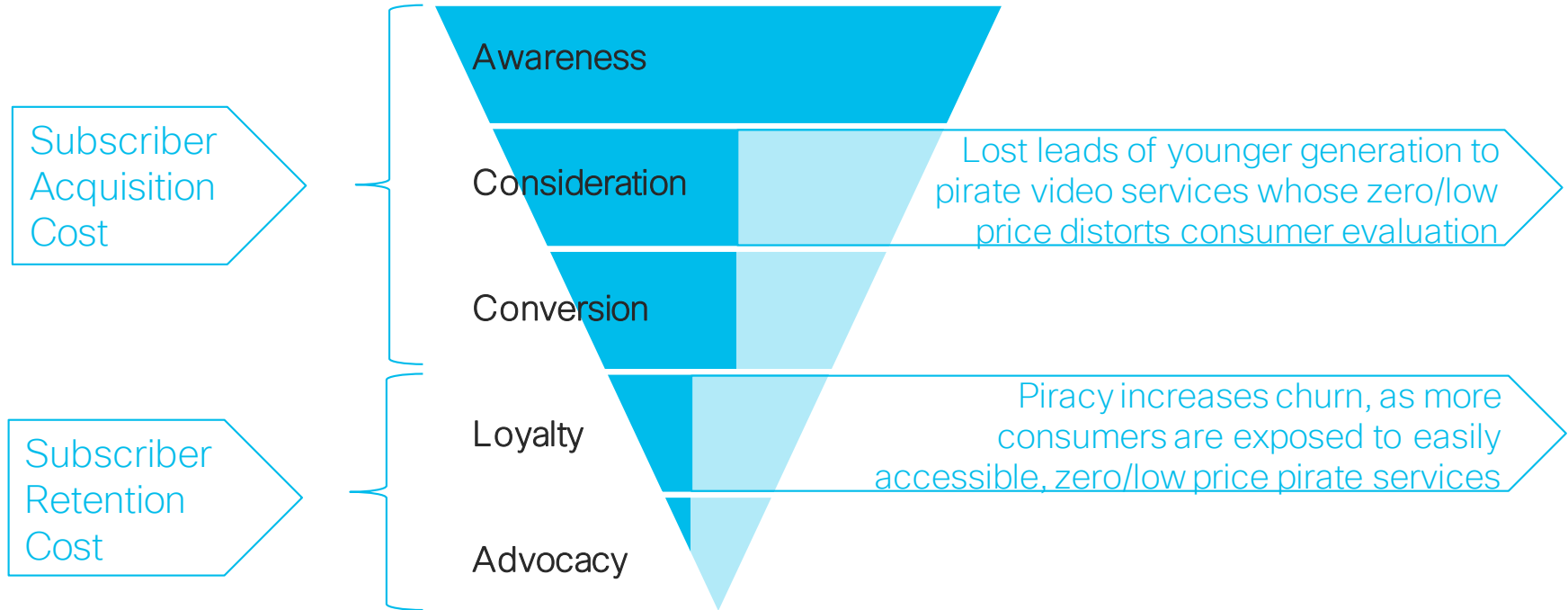
$12 billion

8

4

2017   2021

Estimates use of pay-TV log-ins paid for by someone outside the home
Source: Parks Associates

Bloomberg

Piracy Distorts the Pay-TV Marketing Funnel

Marketing Investment

Distortion due to piracy

Subscriber Acquisition Cost

Subscriber Retention Cost

Awareness

Consideration

Conversion

Loyalty

Advocacy

Lost leads of younger generation to pirate video services whose zero/low price distorts consumer evaluation

Piracy increases churn, as more consumers are exposed to easily accessible, zero/low price pirate services

Anti-Piracy Investment to Protect Video Revenues

Content Revenue to be Secured by Anti-Piracy to Reach $215 Billion in 2022

Live Sports Rights: US$55 Bn in '22

Early Release VOD: US$12 Bn in '22

UltraHD* Content: US$95 Bn in '22

Exclusive Series: US$117 Bn in '22

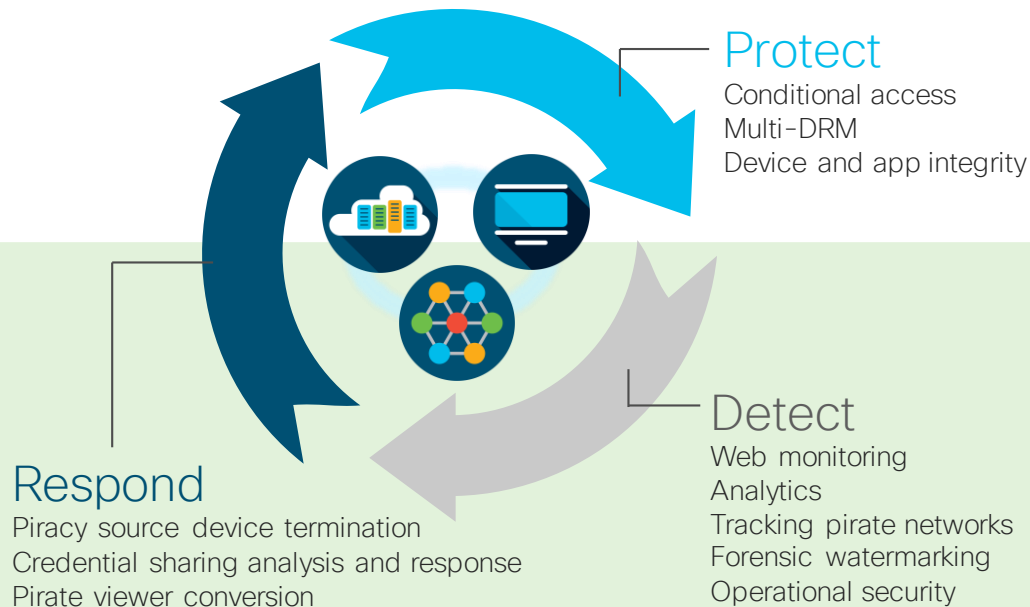- UltraHD overlaps with the other three categories. Total value is ~US$215 billion

Source: ABI Research '17

"Converting 10% of pirate users into legitimate users is realistic and feasible"

Namir Kahn, PwC at CSDA Summit 2017

Cisco Anti-Piracy Approach

Cisco's VideoGuard Everywhere Extends Security from 'Protect' to 'Detect & Respond'

Protect
Conditional access
Multi-DRM
Device and app integrity

Detect
Web monitoring
Analytics
Tracking pirate networks
Forensic watermarking
Operational security

Respond
Piracy source device termination
Credential sharing analysis and response
Pirate viewer conversion

- Detect unauthorized distribution with real-time monitoring and big data analytics.
- Respond to detected piracy in real time.

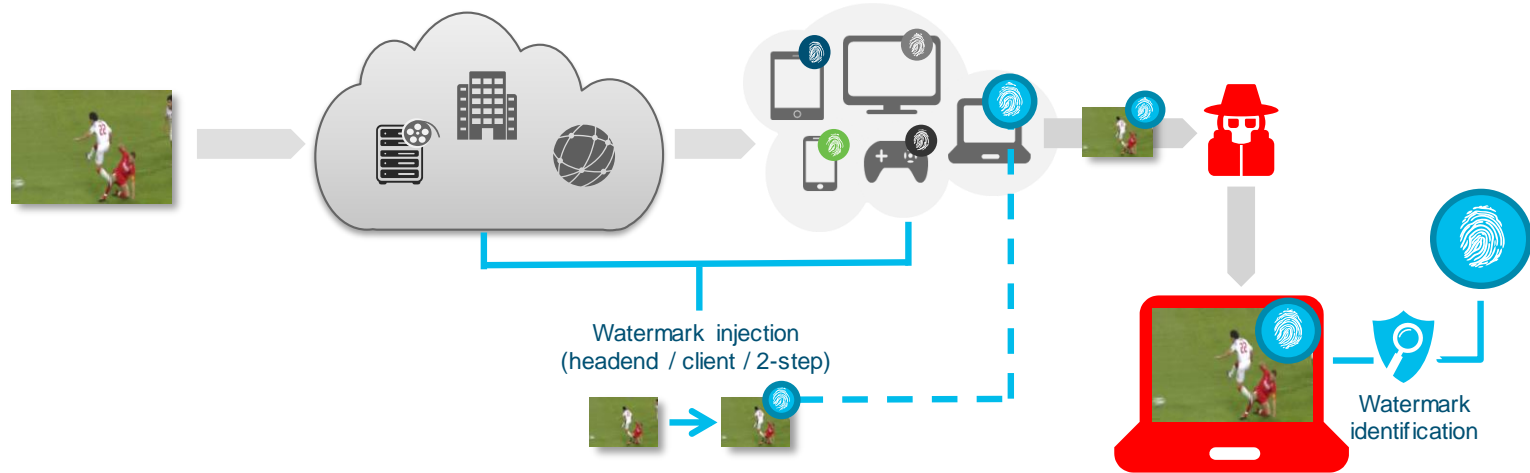| Forensic Watermark | Streaming Piracy Prevention | Credentials Sharing Prevention |

| Pirate User/Entity Behavior Analytics |

Forensic Watermark

- Rapid Watermark
- Headend-based Watermark

Forensic Watermarking for Video

Forensic watermarking = embedding digital information in a video signal to identify its source of origin

Watermark injection
(headend / client / 2-step)

Watermark
identification

Cisco Rapid Watermark
Designed for Piracy Prevention for Live Streaming Content

Fast	Imperceptible	Robust
Very short injection and detection times	Covert watermark; does not disrupt viewer experience	Flexible and configurable; multiple techniques available

- Protects both broadcast and OTT services
  - Operates on STBs, including legacy HD STBs and consumer devices
- Simple yet secure overlay-based technology
  - Low processing requirements
  - Encoding and content agnostic
- Real-time piracy termination with Streaming Piracy Prevention

Cisco Headend-based Watermark
Designed for OTT content on consumer devices

Simple Deployment
No integration on client;
Technology agnostic

Imperceptible
Designed to meet studio
requirements & 4K compliance

Robust
Avoids hacking by design;
Patent-pending technology

- Protects OTT services with great device reach
  - Any DRM
  - Any ABR format
  - Any commercial CDN

- Uses A/B variants technology - allows signaling the ID as a sequence of A and B

- Real-time piracy termination with Streaming Piracy Prevention

Streaming Piracy Prevention

- Gather Evidence
- Automatically Respond to Piracy

Streaming Piracy Prevention
Respond to Live Online Piracy in Real Time

Grow subscriber base
Increase subscriber acquisition and retention by eliminating the competition of illegal content redistribution

Improve monetization
Protect the value of your premium content investments

Extend client device lifetime
Secure content distribution to a broad range of existing devices with Cisco's minimal footprint solution

Locate
Locate illegal streams automatically and/or with OpSec

Identify
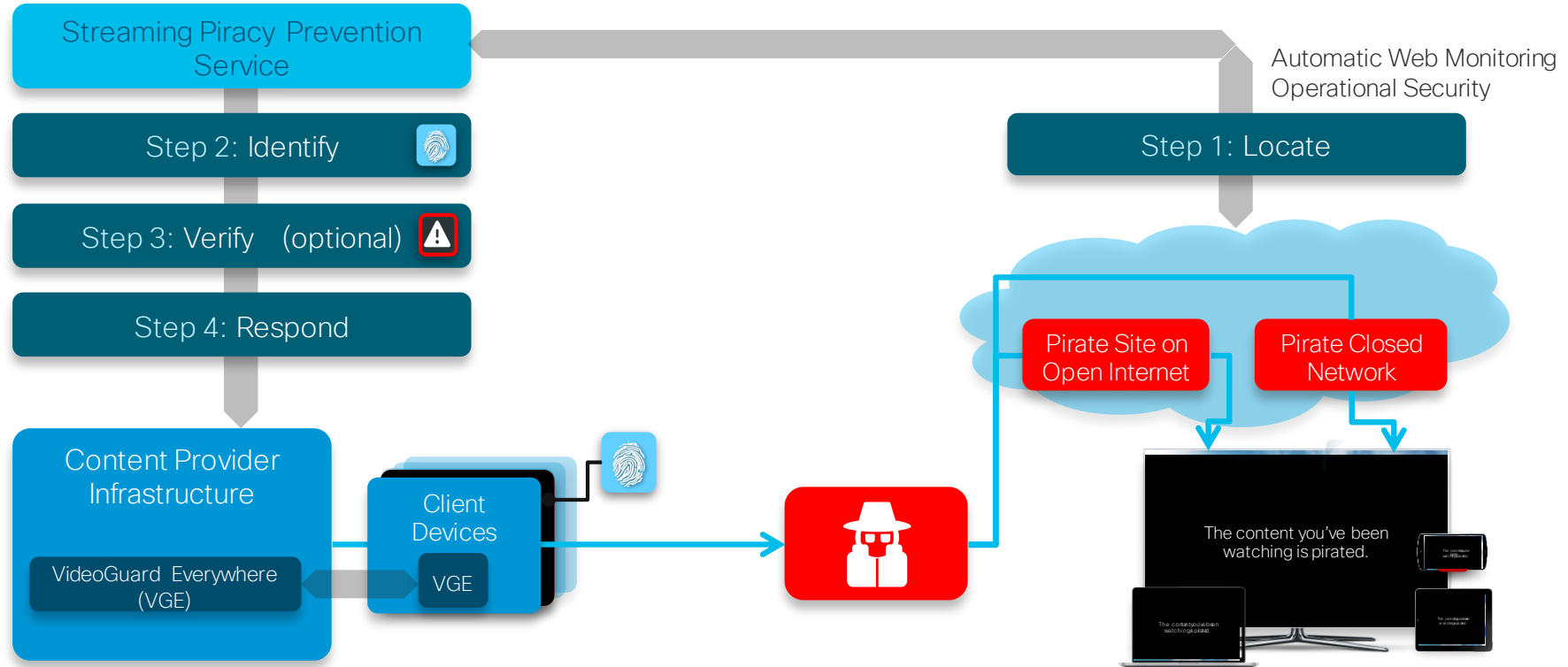Identify piracy source with advanced watermarking techniques

Verify
Verify the pirate's ID by sending a unique command to the suspicious source

Respond
Deactivate service on pirate device or send custom message to illegal viewers for monetization

Streaming Piracy Prevention (SPP): How It Works

Streaming Piracy Prevention Service

Automatic Web Monitoring
Operational Security

Step 2: Identify

Step 3: Verify   (optional)

Step 4: Respond

Step 1: Locate

Content Provider Infrastructure

VideoGuard Everywhere (VGE)

Client Devices

VGE

Pirate Site on Open Internet

Pirate Closed Network

The content you've been watching is pirated.

Advantages of Managed Service for SPP:
Keep-up with Piracy Shift to Re-distribution Threats

"*Content protection must shift to operational models using enforcement*" ABI Research
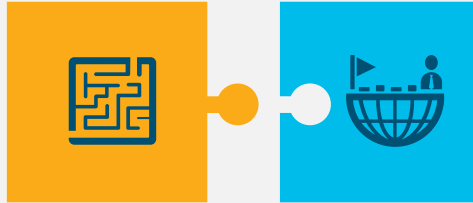
Cisco's OpSec: Established, experienced, intelligence-gathering operation worldwide

Proactive Preparations for Monitoring Piracy

- Research pirate attempts to work around Cisco security products (including the anti-piracy tools)
- Predict what pirates will do next
- Input for configuration of Watermarking and Streaminatgor tools

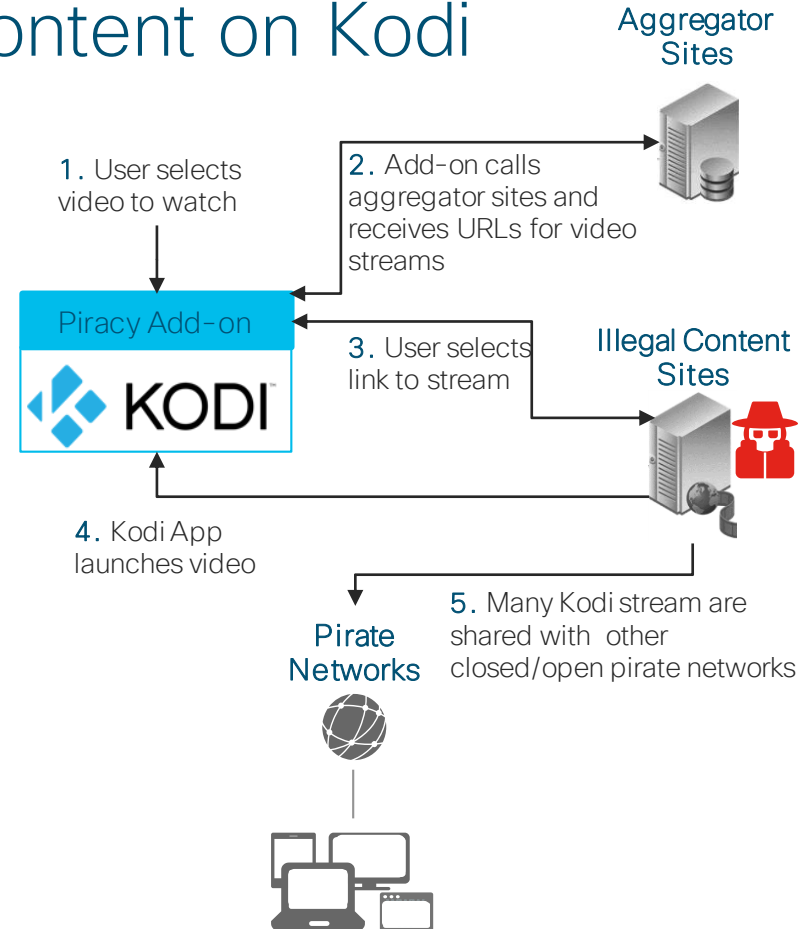### Only Solution for Closed Pirate Networks

- Investigate pirate network business model and its primary dealers
- Obtain subscriptions and devices to verify services and perform software and hardware analysis

Real-Time and Non-real-time Response

- Based on customer needs – ongoing and/or event based
- Suggest actions to customers (whether legal or not)
- Use sophisticated electronic counter measures
- Prepare evidence reports
- Establish close ties with law enforcement agencies

Using SPP to Fight Pirated Content on Kodi

- Cisco focuses on closed pirate networks and Kodi-based piracy is treated as a closed network:
  - Requires download and installation of software add-ons
  - Often requires paid subscription

- Cisco fights closed pirate networks with Streaming Piracy Prevention & Rapid Watermark

- Ripple effect of fighting Kodi-based piracy
  - Most of the Kodi content is sourced from other open and closed pirate networks
  - OpSec researches Kodi add-ons to locate pirate sources, and address them with Streaming Piracy Prevention tools

Aggregator Sites

1. User selects video to watch

2. Add-on calls aggregator sites and receives URLs for video streams

Piracy Add-on

KODI

3. User selects link to stream

Illegal Content Sites

4. Kodi App launches video

Pirate Networks

5. Many Kodi stream are shared with other closed/open pirate networks

Credentials Sharing Prevention

Credentials Sharing Prevention
Data Analytics to Differentiate Credential Sharing Types

>20% of adults use someone else's subscription*

Video Security Data Analytics

Convert to Paying Subscribers

Extract Features from Logs

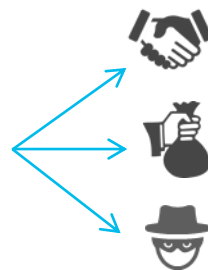Accounts/Devices

Recommendation Integrity

Access Failures

Timing

Location

Setup Changes

UX/Session Navigation

Classify Credential Sharing Accounts

Detect and analyze credential sharing behavior outside household

Casual – friends/family

Business – pool/sublet

Stolen

Trigger Response Based on Sharing Type
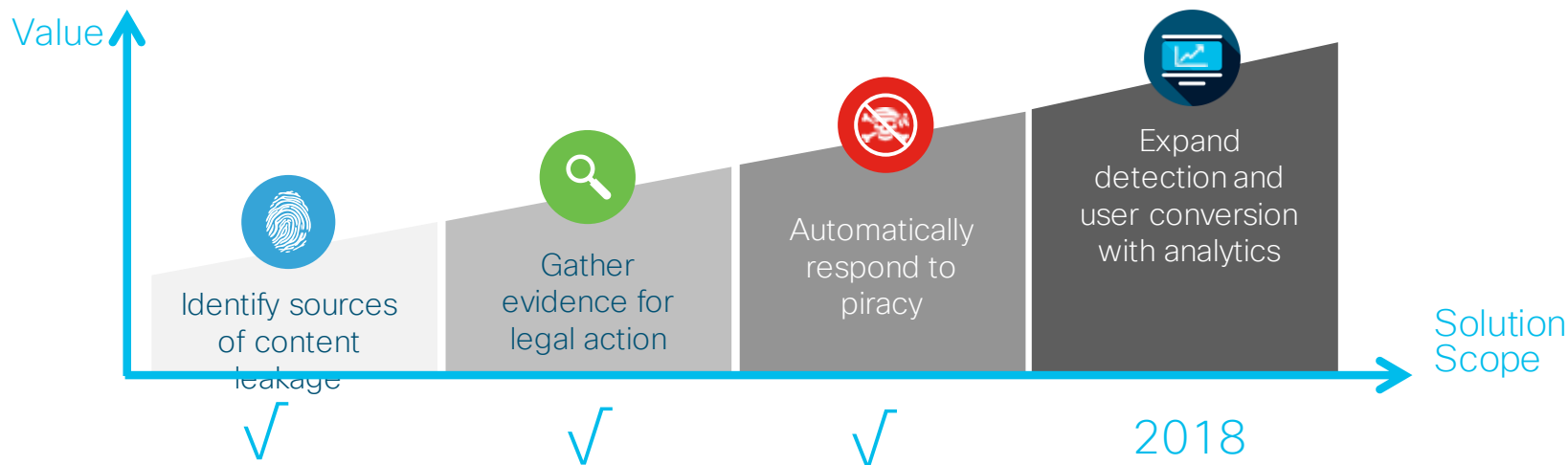
Messaging and Entitlement Control

*Source: Parks Associates

Anti-Piracy Analytics Enhancements

Analytics for More Automated, Scalable Anti-Piracy

Leverage data available in IP video distribution networks

Summary

Summary

- Video piracy is moving to online redistribution

- Cisco's anti-piracy extends security from 'Protect' to 'Detect & Respond'
  - Watermark
  - Streaming Piracy Prevention
  - Credentials Sharing Prevention

- This year – greater scale and automation for anti-piracy with analytics

Sources

- ABI Research

- Sandvine

- UK Government

- The Guardian

- LaunchLeap

- Anatomy Media

- YouGov

- S&P Global

- Dataxis

- Forbes

- MUSO

- Hollywood Reporter

- Bloomberg

- PwC

- Parks Associates

- Ovum

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