Trends in Video Entertainment
Digital Service Providers in the age of OTT
Jonathan Beavon
Director Strategy, Service Provider Video
January 2016
• Video Market Trends
• Virtualization of Video solutions
• Examples
PayTV is Fundamental to Service Provider’s “Bundle Economics”

- Triple-play bundles becoming a fundamental part of pay-TV economics.

- Growth in Broadband, Mobile, IPTV & other OTT services fuel this bundling trend.

Grow, Protect, Retain Revenues. Product diversification: focus on margins & RGUs.
UK & USA:
So, are Younger Generations watching less TV?

- Yes, less “traditional TV” …
USA: Live TV still dominates but is declining OTT and Smart Phone activities growing & significant.

- Live TV viewing is declining
  - 2013: 4h29 min / day
  - 2015: 4h11 mins / day

- Increasing use of multimedia devices + DVR (Chromecast, Apple TV, Roku, Tablets, Smart TV)
  - 2013: 0:27 min / day
  - 2015: 0:38 mins / day
  - Not always tied to MVPD / Pay-TV subscriptions

- Smart Phone use up 30 mins `13 to `15.
  - Not necessarily TV content.
  - Growth in short-form and socially discovered content

Source: Nielsen Total Audience Report Q2 2015
... and watching more “Internet” video.
USA: YouTube Stars More Popular Than Mainstream Celebs Among U.S. Teens

SURVEY: YOUTUBE STARS SHINE BRIGHTEST
Hollywood celebrities aren’t as appealing to U.S. teens — and it’s not even close

1. Smosh
Survey Score: 93
2. The Fine Bros.
Survey Score: 92
3. PewDiePie
Survey Score: 92
4. KSI
Survey Score: 84
5. Ryan Higa
Survey Score: 81
6. Paul Walker
Survey Score: 75
7. Jennifer Lawrence
Survey Score: 74
8. Shane Dawson
Survey Score: 72
9. Katy Perry
Survey Score: 70
10. Steve Carell
Survey Score: 69
11. Seth Rogen
Survey Score: 68
12. Betty White
Survey Score: 65
13. Vin Diesel
Survey Score: 65
14. Johnny Depp
Survey Score: 63
15. Daniel Radcliffe
Survey Score: 61
16. Jesse Marcklin
Survey Score: 59
17. Michelle Phan
Survey Score: 59
18. Ray William Johnson
Survey Score: 27
19. Online Star
Hollywood/Pop Star

Pay TV SPs: TVEverywhere

Internet Giants

OTT Aggregators

Content Providers
The OTT Battlefield is Fragmented & Competitive

<table>
<thead>
<tr>
<th>Service Providers</th>
<th>Content Providers</th>
<th>Local OTT Providers</th>
<th>Global Tech Giants</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
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<td>ANYWHERE</td>
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India

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Europe

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<td>Sky Go</td>
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<td>NOW TV Player</td>
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<td>Player</td>
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India
Digital TV & Broadband Subscribers (Millions)

TV

- Digital Cable
- Digital Satellite
- IPTV
- TVE

Broadband

- Fixed Broadband
- Wireless BB
- TVHH


Subscribers: Millions
Digital Pay TV Growth: 175 M more subs, mostly from Asia.
OTT Video Growth: Subscription VOD.
(Similar subscriber growth to payTV but ARPU lower)
Linear TV
On Demand
Linear TV

- Pay TV (Subscription)
  - Advertising
  - State Funded

Entertainment, Live Sport, News

On Demand TV

- Subscription (SVOD)
  - Advertising (Catch Up)
  - Transactional (TVOD)

Pure Entertainment Focus
On demand & Pay TV Business Models

- Commercial Terms
  - Min Prices, Min. Guarantees, Revenue Shares, Exclusivity
  - CDVR: Breaks some Content Provider’s commercial objectives.

- Technical Requirements
  - Content Security, Video Formats, Reporting, Metadata
  - CDVR: Great for Consumers & Service Providers.

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<tr>
<th>Stage</th>
<th>DVD / EST</th>
<th>TVOD</th>
<th>Pay TV #1 (SVOD)</th>
<th>Pay TV #2 (SVOD)</th>
<th>Free TV +Catch-up</th>
<th>Libraries (SVOD)</th>
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<td>+4 months</td>
<td>+4 to 5 months</td>
<td>+1 year</td>
<td>+1.5 to 2y</td>
<td>&gt;2.5y</td>
<td>&gt;</td>
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+4 to 5 months
Question 1

• My future profits will be generated by:

A. Broadband
B. Linear TV
C. On Demand Entertainment
D. Bundles
Service Provider Video
Market & Technology Trends

Consumers Embrace
On-demand & Multiscreen

Content Providers & OTT
Cooperation & Competition

Data Driven
Recs., Search, Marketing

Next Gen
Platform
Flexible & Multiscreen

Technology

4 K Video, Cloud Encoding

Cloud & Agile
Rapidly Changing market
Netflix is the biggest OTT player. Targeting Global Netflix by E/2016

- **Clear Focus on Entertainment**
  - Movies & TV series. No sport, no news.
  - Content Localization, Original Content Production

- **69 M subscribers WW E/2015**
  - 43M in US
  - Slightly slower than expected uptake in LATAM

- **Trying to launch in China. Huge potential in Asia but …**
  - Obstacles: low BB penetration & speeds, local competition, content licensing complications

- **Using Cloud Technology to Transformation the Video Business**
  - Born in the cloud, frequent, automated feature rollouts, Agile teams responsible for Dev & Ops
  - Focus on content discovery & UI, Multi-device support, Not burdened by legacy tech & STBs

- **Less Capex & Opex than SPs**
  - No need to dig roads or launch satellites. Leaner operating models

---

Cooperation or Competition
Service Providers + OTT : A Win-Win?
Content Distribution Deals & Data Bundles
Simultaneous & Rapid Innovation Across Multiple Technology Areas.

- UHD (4K, HDR)
- Content & Data Security (DRM/CA/Internet)
- On Demand (OTT)
- Cloud DVR (Storage)
- New Features (Velocity & XaaS, Cloud)
- Multiscreen
- Internet Distribution (CDN, DOCSIS, 4G/5G)
- Analytics (Recs, Ads, Search, Marketing)
Questions 2

• OTT Video Services are:

A. A threat
B. Already part of my service
C. A potential partner
D. Irrelevant in my market.
Changing the Way People Are Entertained and Informed
Cisco Video Software & Solutions

“Infinite” Platforms

Infinite Broadcast
1-way & Hybrid

Including: Client Software / Middleware, UI / UX, Security

Infinite Home
Cable & 2-way

Infinite Video
OTT, Rapid Deployment
Virtualized Video Processing (V2P)

- Video Encoding & Processing (Virtual DCM)
- CDN (Open Media Distribution OMD)
- Virtualized components (Recorder, Playback)
- Virtualized Platform Controller (V2P Controller)
- CDVR, VOD, Catch-up (Cloud Object Store – COS)
Security

Videoguard Everywhere VGE
(Video Service Protection)

Integrated Solution
- DRM & Multi DRM
- Conditional Access (CA)
- Downloadable CA (DCAS)

Security

Anti-Piracy Services
(Streaming Piracy Protection)

Data Center Security
(Internet Threat detection)
Cisco Industry Leadership

Over 70 aaS Customers

Virtualized Video Processing

Security

Infinite Solutions

Open, Validated NFV Infrastructure

Trusted Partner

#1 Video and Data Center Security

$100B+ in customer revenue protected

300M+ active client devices secured
Cisco Infinite Solutions

One Cloud
Any Network
Any Device

Intercloud

Captivating UX  DevOps for Video  E2E delivered aaS

Seamless extension of Pay-TV experiences to multiple screens for Cable, Satellite, Telco

OTT solution to create new content monetization opportunities for content and service providers
Infinite Solutions Customer Case Studies

**Infinite Home**

One of the largest Service Providers in Europe

- Deploying Cisco Infinite Home, V2P and Security
- A multi-screen Pay-TV service with immersive viewer experience
- Primary entertainment hub in the home, combining broadcast, OTT content and application

**Infinite Video**

One of the largest motion picture exhibitors, with its American Multi-Cinema

- Infinite Video enables AMC to quickly expand content reach leveraging OTT to consumer electronics (CE) devices
- Doc Club and Shudder are going to market with paid offerings on Roku, AppleTV, iOS, Android and Web

**Infinite Broadcast**

Leading Satellite Service Provider in Turkey

- Cisco to install application software in the cloud
- Enable subscriber to view multiple sources of content on multiple devices with a consistent user experience
- Support hybrid – broadcast and OTT content delivery

[YouTube video](https://youtu.be/8thgUh2OEs)
## Infinite Solutions
### Captivating User Experience

<table>
<thead>
<tr>
<th>Optimized to device type and network condition to provide excellent performance</th>
<th>Personalized, with profiles, recommendations, content sharing, favorites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide range of all popular devices and platforms for primary and secondary screens</td>
<td>Targeted to your subscribers, based on real-time testing and analysis</td>
</tr>
<tr>
<td>Consistent experience provided from the cloud to all types of devices</td>
<td>Proven, deployed globally with over 100 customers</td>
</tr>
</tbody>
</table>
Cisco Infinite Solutions
DevOps for Video

Built for the Cloud – supports global aaS customer base

- Micro services architecture that enables service velocity
- Multiple cloud instances for gradual service introduction

Rapid cycle of development, testing and launch of new innovations

- Continuous integration and deployment (CI/CD) processes and tools
- Business and operational analytics tools

Private Clouds

Public Clouds
Infinite Solutions
End-to-end Solution Delivered as a Service

- Pre-integrated and tested with proactive roadmap
- Open ecosystem – 3rd party innovation
- Automated and virtualized video processing workflows
- Securing the end-to-end video delivery value chain
- Delivering linear, on demand and cloud DVR services
### Infinite Solutions Selected aaS Customers

<table>
<thead>
<tr>
<th>sky</th>
<th>DIRECTV</th>
<th>CBS</th>
<th>AMC</th>
<th>Hallmark</th>
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<td>Stan.</td>
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### Infinite Solutions Selected Partners

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<td>Signiant</td>
<td>DDB</td>
<td>INNOVD</td>
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</table>
Cisco Virtualized Video Processing
Video Processing Transformation

Legacy

2015: Virtualized Main Screen Functions

Applications
- Live
- TV VOD
- IOS VOD
- cDVR

Orchestration
- openstack
- DAYLIGHT

Orchestration
- xCode
- Mux/Stat Mux

Infrastructure
- Compute
- Storage
- Network

- IP Video
- DPI
- Live
- TV VOD
- IOS VOD
- cDVR
Video Processing Transformation

2014: Virtualized Applications
Orchestration
Infrastructure
Storage
Network
Compute

2015: Virtualized Main Functions
Live Mux/Stat Mux
xCode
IP Video
DPI

2016: Video Headend Innovation
Virtual Functions
Encoding
Bandwidth Optimization
Packaging

2016: Video Headend Innovation
Elastic scaling for all video services from converged software-defined storage

Cloud Object Storage
Live
TV VOD
IOS VOD
cDVR

Open Media Distribution
Transforming how CDNs are built, operated and deployed with an open, SaaS and NFV model

Open Source
3rd Party

V2P Platform Controller
Open integration framework simplifying deployment and orchestration of virtualized functions across hybrid infrastructure

3rd Party
Open Source
3rd Party

Orchestration
Infrastructure
Compute
Storage
Network

Orchestration
Applications
Storage
CDN

Orchestration
Applications
Cloud Object Storage
Open Media Distribution

Cisco
Virtual DCM
Virtual Recorder
Virtual Playback
Cloud Object Storage
Open Media Distribution

Virtual Functions
Capture
Encrypt
xCode
Play out
Ad Splice

3rd Party
Bandwidth Optimization
Encoding
Packaging
V2P Powers Cisco Infinite Solutions

- Pre-integrated and tested for rapid service deployment
- Support picture quality for main screen video delivery
- ABR, DRM, CDN orchestration for multiscreen delivery
- Flexible deployment across hybrid cloud infrastructure
- Unified storage for all video services
- Feature velocity with DevOps and CI/CD

V2P Platform

Application Integration Framework
Workflow Integration Framework
V2P Controller

Bandwidth Optimization
Encoding
Packaging
Virtual DCM
Virtual Recorder
Virtual Playlist
Cloud Object Storage
Open Media Distribution

Cloud
OpenStack
Docker
Moving to open, IP and cloud based video delivery allows you to monetize new market opportunities…

… It also makes video delivery more complex, and more challenging to secure …
To enable your business, you need an end-to-end security solution.
VideoGuard Everywhere
Enabling New Video Experiences

VGE Connected
Multi-screen security solution for Telco’s and Cable Service Providers providing Two-way video experience, anywhere

VGE Hybrid
Multi-screen security solution for Satellite and Cable Service Providers providing One-way and Hybrid video experience anywhere

VGE OTT
OTT security solution for Content and Service Providers to create new content monetization opportunities
VideoGuard Everywhere Market Traction

- 300M active client devices
- Largest DCAS deployment in the world: >4M active devices
- Over 50M new cards every year
- Multiple deployments with: >20M Active clients
- Largest hybrid broadcast deployments in the world: >60% of DTH market
- >4.5M active mobile devices in a single SP OTT deployment
Enabling Premium Experience for Sky Q

Seamless experience across devices, in and out of home; cost optimized implementation

| View and record linear and on-demand content | Record and watch premium UHD content | Consume content on the gateway and share between devices at home | Download content on mobile device to take and watch anywhere, even without Internet connection | Enjoy unified user experience for all Sky home networking and OTT services |

**VGE on Sky Q box**
- Seamless transition from CA to DRM protection
- DVR protection
- High quality live streaming with review buffer and recorded content sharing to managed and consumer devices
- Secure transcoding support for mobile devices
- Flexible device, concurrency, proximity control
- Allow consumer devices to download content securely to watch on the go

**VGE on client devices**
- Single product supporting both satellite and OTT content and full feature set across multiple devices
- Proactive enhancements to stay aligned with constantly changing technology
- Ongoing addition of supported devices

View and record linear and on-demand content
Record and watch premium UHD content
Consume content on the gateway and share between devices at home
Download content on mobile device to take and watch anywhere, even without Internet connection
Enjoy unified user experience for all Sky home networking and OTT services

Enjoy unified user experience for all Sky home networking and OTT services

Seamless experience across devices, in and out of home; cost optimized implementation
Summary

Cisco Enables Service and Content Providers Transformation to Cloud
Question 3

- Virtualization of my TV platform:
  
  A. Will increase speed of new feature delivery
  
  B. Will allow me to compete with OTT
  
  C. Will help me integrated partners in to my service
  
  D. Not this year – this is too cutting edge.
APPENDIX: CASE STUDIES
Charter Innovates Experiences with Worldbox
Featuring Cisco VideoGuard Downloadable Security Solution

OBJECTIVE
• Deploy new Spectrum UI experience and downloadable security across all subscribers

SOLUTION
• Cisco VideoGuard Server for downloadable conditional access system (DCAS)
• Cisco VideoGuard DRM
• Cisco Set-top Box

RESULTS
“Cisco shares Charter’s vision of the future of network architecture, where our network’s intelligence is located in the cloud rather than in devices at the edge. We are excited that Cisco will be a key supplier of the Charter Worldbox, and that their Downloadable Security Solution and Digital Rights Management solutions will be part of Charter’s next-generation, cloud-based video solution.”
Tom Rutledge, President and CEO
Comcast Enables Cloud-based Next-Gen Video Services

OBJECTIVE
• Launch advanced cloud based video services using Openstack as a foundation (e.g., X1 Platform)
• Deploy high speed gateway clients to enrich multi-screen experience

SOLUTION
• Openstack support for cloud-based services (e.g., X1 Platform)
• Cisco RDK-based Clients
• Cisco DOCSIS 3.0 Wireless Residential Gateways

RESULTS
• New Cloud-based user interfaces, video services such as Multi-screen Cloud DVR
• DOCSIS 3.0 powered Xfinity Wireless Gateway that doubles Internet speeds for multi-screen devices
• Video from Neil Smit, CEO
VODAFONE: Kabel Deutschland Leverages the Cloud to Create New Video Services

OBJECTIVE
• Deliver converged, personalized, social, multi-screen video experiences
• Utilize a standardized, IP-based, cloud-powered platform

SOLUTION
• Virtualized Video Processing
• Videoscape Cloud Services
• Videoscape Set-Top Boxes

RESULTS
“Our video future lies in delivering converged, personalized, social, multi-screen video experiences, from a standardized, IP-based, cloud-powered platform. We have chosen Cisco as our partner for software and set-top boxes because Cisco shares these fundamental tenets, and their products and plans best realize them.”
Manuel Cubero, CEO, Kabel Deutschland
Eastlink Delivers Personalized Video Across Screens

OBJECTIVE

• Migrate video processing and management into the cloud
• Accelerate time-to-market

SOLUTION

• Cisco Infinite Video

RESULTS

• “We plan to trial Infinite Video next quarter to deliver next-gen personalized video to multiple screens. We need a solution that combines a great user experience and comprehensive video services with fast time-to-market and continuous improvement that only the cloud can deliver. Cisco’s Infinite Video promises these characteristics plus the operational readiness, scale and flexibility we expect from Cisco, and we are looking forward to seeing the product in action.”
• Jim Fitzgerald, SVP, Engineering and CTO, Eastlink
VODAFONE: Kabel Deutschland Accelerates Cloud Video Plans

OBJECTIVE

• Move video control, management and functionality into the cloud
• Update features and offer new services faster

SOLUTION

• Cisco Infinite Home Solution

RESULTS

• “The platform moves control and functionality into the cloud, making it quick and easy for Kabel Deutschland to rapidly update features and offer new services. Kabel Deutschland is working with Cisco on this new platform, which uses Cisco’s Infinite Home solution.”
• Florian Landgraf, SVP Product Development, Kabel Deutschland
Sky Invests in Seamless TV Security Across Any Device

OBJECTIVE
• Securely deliver its content to its 21M subscriber base
• Expand service authentication beyond the traditional TV screen

SOLUTION
• Cisco VideoGuard Everywhere for Conditional Access & Digital Rights Management solution

RESULTS
• “Our relationship with Cisco is critical to helping us realize our vision to accelerate time to market for the delivery of advanced entertainment services for our DTH subscribers that offer greater choice, convenience and control.”
• Alun Webber, Managing Director, Product Design & Development, Sky
nc+ Simplifies and Redefines OTT Video

**OBJECTIVE**
- Unify video processing infrastructure
- Deliver new multiscreen video services quickly and cost-efficiently

**SOLUTION**
- Cisco Virtualized Video Processing (V2P)
- Cisco UCS & Catalyst Switches
- Cisco Cloud Object Store (COS)
- Cisco Services

**RESULTS**
- “In this highly competitive marketplace, the key to staying ahead lies in achieving balance between addressing current customer demands and making insight-led investments in future trends. nc+ recognizes the role of innovation in building a sustainable growth strategy, and our collaboration with Cisco is testament to that commitment.”
- Jaroslaw Kordalewski, EVP IT and Technology, nc+
TV Globo Automates and Orchestrates Video

OBJECTIVE
- Create more agility in video processing with its new media content partners

SOLUTION
- Cisco Virtualized Video Processing (V2P)
- Cisco UCS and Nexus switches
- Cisco Services

RESULTS
“With the amount of content we produce and manage, we are consistently working to improve the efficiency of our operations, and transform the way we deliver a variety of content to millions of viewers, on traditional and new media. Our collaboration with Cisco will enable Globo to operate with the required agility to streamline video workflows and deliver quality multiscreen video to consumers.”

Raymundo Barros, CTO, TV Globo
Altice Group Moves Toward a Multi-Access Platform

OBJECTIVE

• Integrate video, data and voice services onto a single multi-access platform
• Advance its all-IP transition
• Begin DOCSIS 3.1 transition with Numericable (France)

SOLUTION

• Cisco cBR-8 Converged Cable Access Platform (CCAP)

RESULTS

“With a combination of Cisco’s Evolved CCAP, DOCSIS 3.1 and migration to NFV/SDN, Altice will continue providing the best customer experience, based on the highest bandwidth and cutting edge technology.”
Max Blumberg, CTO, Altice Group
Time Warner Cable Demonstrates all-IP Virtualized Video

OBJECTIVE
- Showcase how cable service providers can successfully implement an all-IP Video solution
- Demonstrate integrated security with video delivery

SOLUTION
- Cisco Virtualized Video Processing (V2P)
- Cisco Security Solutions
- Cisco Infinite Video and “as-a-Service”
- Cisco 4K/HEVC Solutions
- Cisco Video-over-IP Production
- Cisco Media Data Center

RESULTS
“The benefits of IP manifest themselves in a number of places. The group’s development teams can now invest in individuals focused on building end-user applications, as opposed to requiring those engineers to understand the entire infrastructure of the plant in order to get a piece of equipment installed.”
Jamie Miles, GVP – National Content, TWC
Canal + Broadcasts UEFA Champions League Final in 4K UHD

**OBJECTIVE**
- Offer subscribers a unique, more immersive video experience
- Display a virtually flawless picture, delivering vivid colors and picture details of the highest quality

**SOLUTION**
- Cisco AnyRes Live ultra high definition (UHD) encoders

**RESULTS**
“Canal+ said its first ever 4K broadcast transmission was as part of a series of experimental 4K broadcasts that had been conducted over the past year, across the entire technical chain.”
Julian Clover, [Broadcast TV News](https://www.broadcast-tv-news.com)
VOO Launches Innovative TV Experiences

OBJECTIVE
• Deliver an unprecedented television experience
• Offers unique content choices for the whole family

SOLUTION
• Cisco Snowflake user interface (UI), mosaic video wall and “app store” delivered via set-top box
• Cisco time-shifted video for “Restart”, “See & Review” services
• Cisco set-top boxes

RESULTS
“Our new video wall is a marquee feature that is sure to become an instant fan favorite. Cisco shares our vision and focus for the TV experience that customers want and need today, which bridges easily into future services.”
Tamara Leemans, CTO, VOO
RECENT PRESS

• Cisco Delivers New Cloud Video Solutions, Gains Market Traction
  (INFINITE BROADCAST & DSMART)

• Cisco Readies Shaw’s CDN To Share Thousands of Video Sources Across Multiple Devices
  (OMD & SHAW)
  • http://newsroom.cisco.com/press-release-content/?size=webcontent&articleId=173676

• Cisco Transforms Storage and Delivery for Multiscreen Video
  (OMD & COS)

• Sky Chooses Security Software & Services Solutions From Cisco for Next-Generation Home Entertainment System
  (SKY Q)

• Sky Turns Its Vision of the Next-Generation TV Experience to Reality
Question 1
- My future profits will be generated by:
  A. Broadband
  B. Linear TV
  C. On Demand Entertainment
  D. Bundles

Questions 2
- OTT Video Services are:
  A. A threat
  B. Already part of my service
  C. A potential partner
  D. Irrelevant in my market.

Question 3
- Virtualization of my TV platform:
  A. Will increase speed of new feature delivery
  B. Will allow me to compete with OTT
  C. Will help me integrated partners into my service
  D. Not this year – this is too cutting edge.
Indian Market Questions for discussion:

- What market transitions and how will you meet these transitions with technology?
- Will the fragmented market consolidate. Who will buy who and what needs to be spent?
- Why is Cable Broadband not taking off?
- Will broadcast platforms become more two-way or on-demand for a better customer experience?