Reinventing the TV Experience:
The Combined Power of Cloud, Network and Client

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CTO, SP Video Technology, Europe
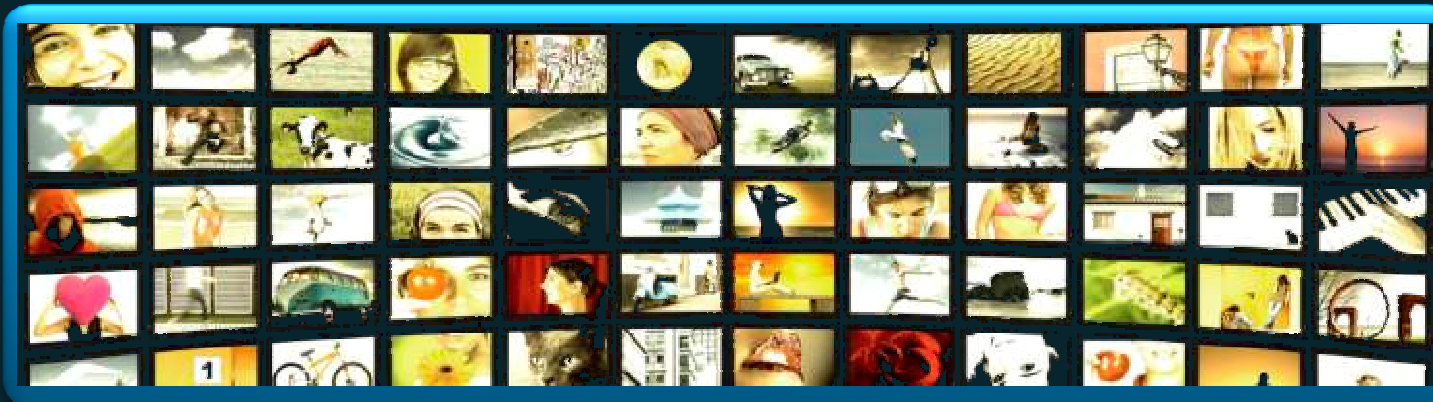
Market Dynamics

12B

Increasing Devices

Increasing Services

Video Everywhere

Consumers Demand Broader Experiences
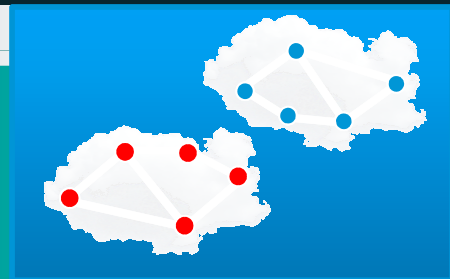
Integrated & Consistent Access -

To:

Infinite
Content
Sources

Over:

Managed &
Unmanaged
Networks
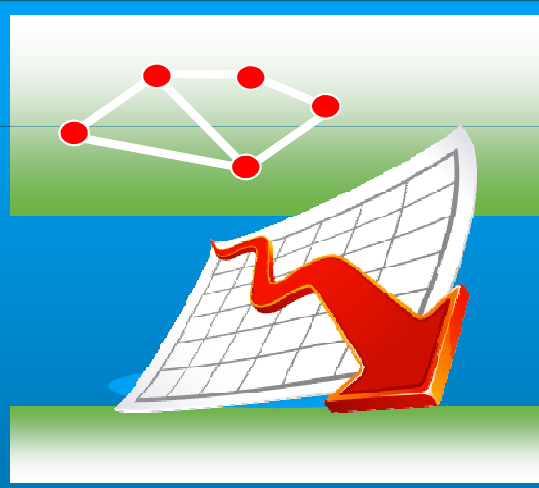
From:

Managed &
Unmanaged
Devices

The Challenge & Opportunity Today

Experience Fragmentation

Diminishing SP Network Relevance

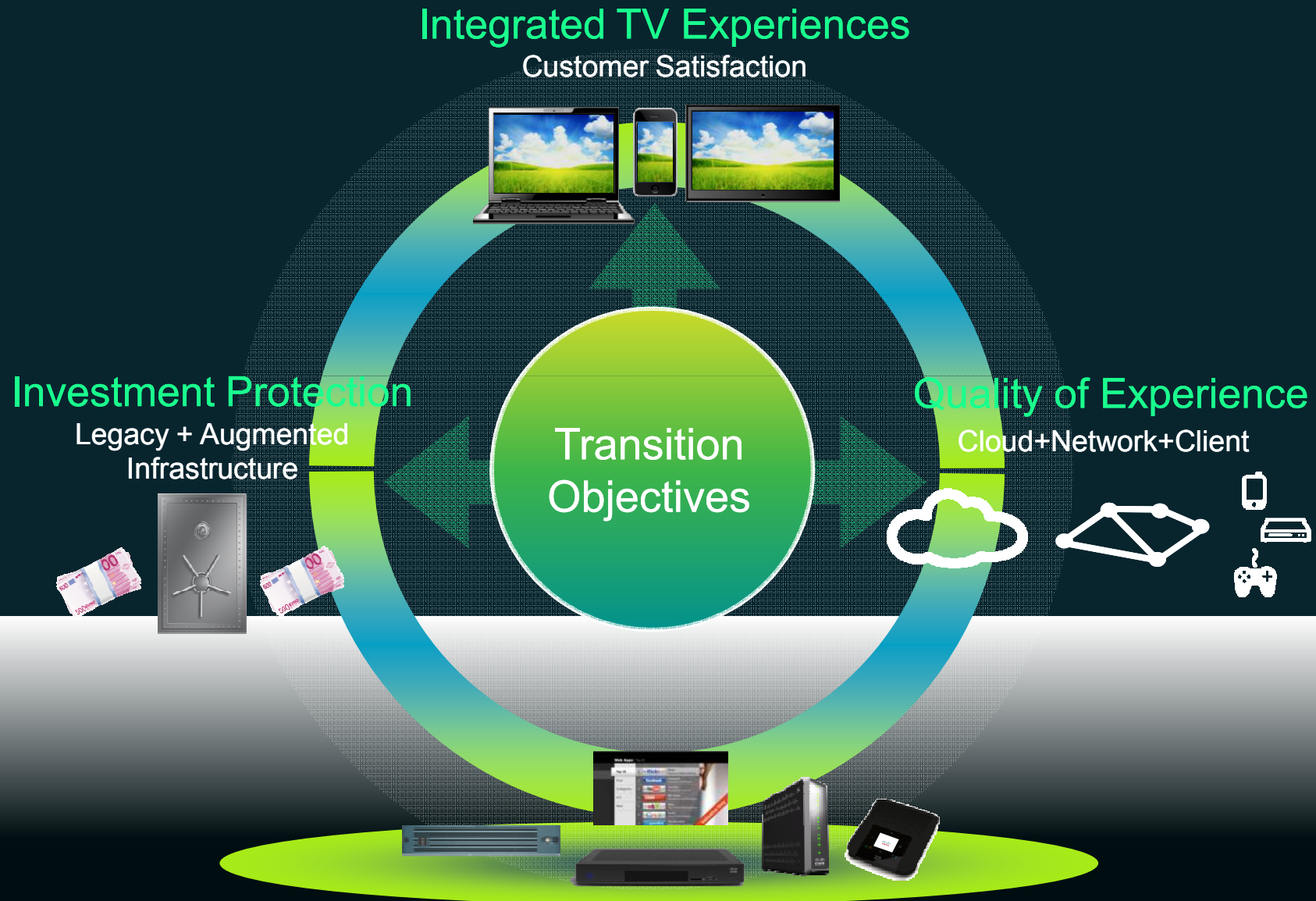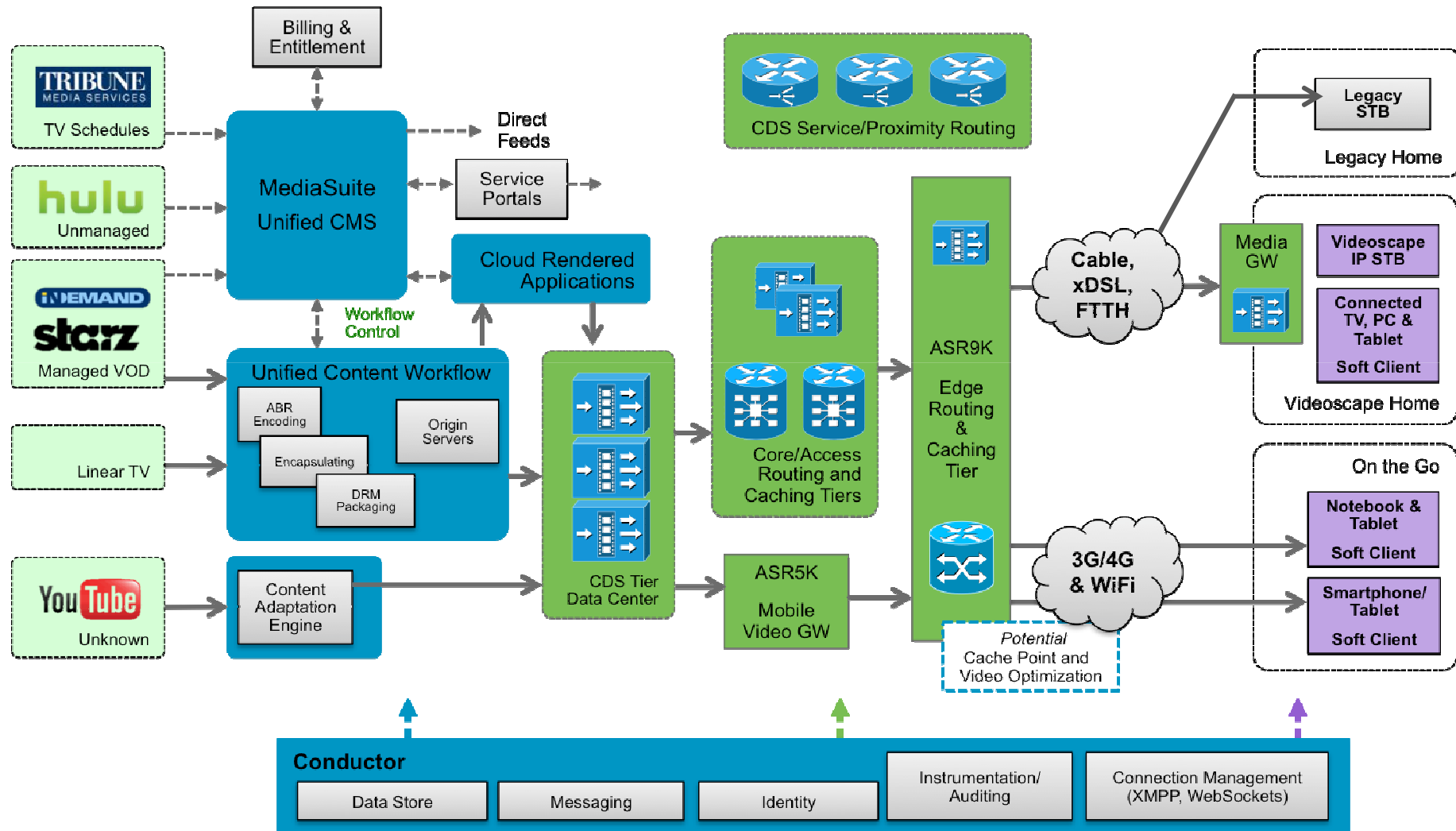**Evolving Legacy Infrastructure**
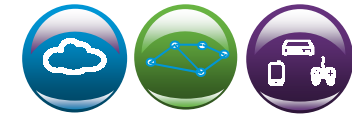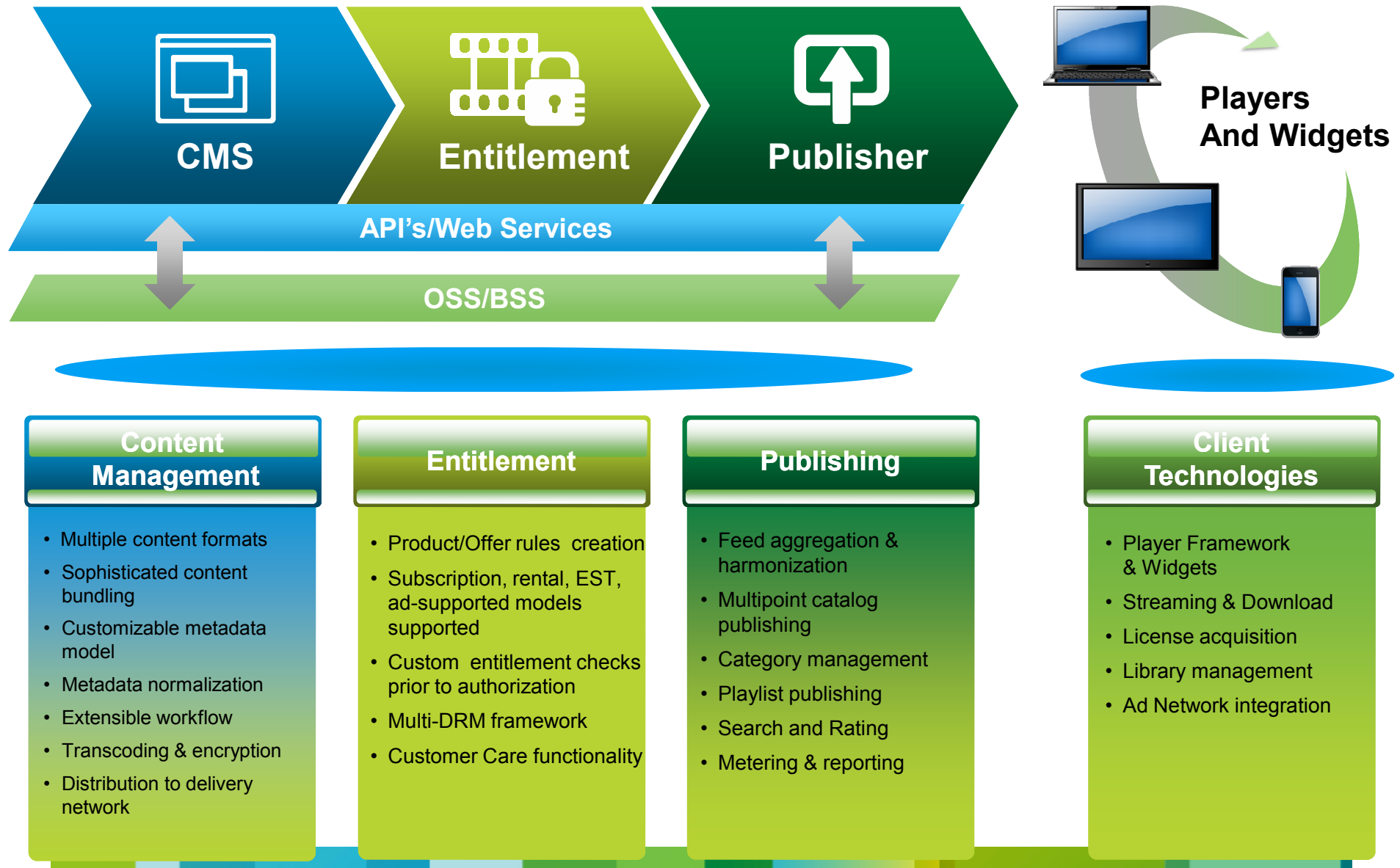
Elements of Success

Integrated TV Experiences
Customer Satisfaction

Investment Protection
Legacy + Augmented
Infrastructure

Quality of Experience
Cloud+Network+Client

Transition Objectives

End-state Videoscape
Optimized for Fixed and Mobile Devices

Billing & Entitlement

TRIBUNE MEDIA SERVICES
TV Schedules

hulu
Unmanaged

iN DEMAND
starz
Managed VOD

Linear TV

You Tube
Unknown

MediaSuite
Unified CMS

Direct Feeds

Service Portals

Cloud Rendered Applications

Workflow Control

Unified Content Workflow
- ABR Encoding
- Origin Servers
- Encapsulating
- DRM Packaging

Content Adaptation Engine

CDS Service/Proximity Routing

CDS Tier Data Center

Core/Access Routing and Caching Tiers

ASR5K
Mobile Video GW

ASR9K
Edge Routing & Caching Tier

Cable, xDSL, FTTH

3G/4G & WiFi

Potential Cache Point and Video Optimization

Legacy STB
Legacy Home

Media GW

Videoscape IP STB

Connected TV, PC & Tablet
Soft Client

Videoscape Home

On the Go

Notebook & Tablet
Soft Client

Smartphone/ Tablet
Soft Client

Conductor
- Data Store
- Messaging
- Identity
- Instrumentation/ Auditing
- Connection Management (XMPP, WebSockets)

Media Suite Platform

CMS → **Entitlement** → **Publisher**

API's/Web Services

OSS/BSS

Players And Widgets

Content Management
- Multiple content formats
- Sophisticated content bundling
- Customizable metadata model
- Metadata normalization
- Extensible workflow
- Transcoding & encryption
- Distribution to delivery network

Entitlement
- Product/Offer rules creation
- Subscription, rental, EST, ad-supported models supported
- Custom entitlement checks prior to authorization
- Multi-DRM framework
- Customer Care functionality

Publishing
- Feed aggregation & harmonization
- Multipoint catalog publishing
- Category management
- Playlist publishing
- Search and Rating
- Metering & reporting

Client Technologies
- Player Framework & Widgets
- Streaming & Download
- License acquisition
- Library management
- Ad Network integration

Linear 1.0

- Key module required to power device app experiences around linear content.

- Console & underlying system to:
  schedule, configure & monitor the ingest of EPG data from source
  create/manage "regions" and map to "channels" (number/logo/URL)

- Ability within MediaSuite to:
  "ingest" the channel info
  determine "entitlement" rule(s) for channel
  create channel "bundles" w/ pricing and additional "enhanced" rich metadata/links/etc

- Enables consumers:
  Search across EPG & VOD
  Blend the Linear and On-Demand experience
  Create "reminders" & "events" mechanism for shows
  Closed captioning support

- *Leverages years of domain expertise in delivering premium linear content solutions for Service Providers*

Today: Associate channels and titles
Future: Associate content identifiers and metadata

Introducing Cisco Videoscape Client Portfolio

Videoscape Media Gateways

- Cloud Driven Service Enablement
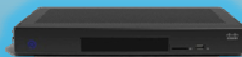- Video Optimized
- Application Centric

Videoscape STBs

- Infinite Content Choices (Broadcast, VoD and Online)
- Web 2.0 applications enabled
- Open publishing environment

Videoscape Soft Clients

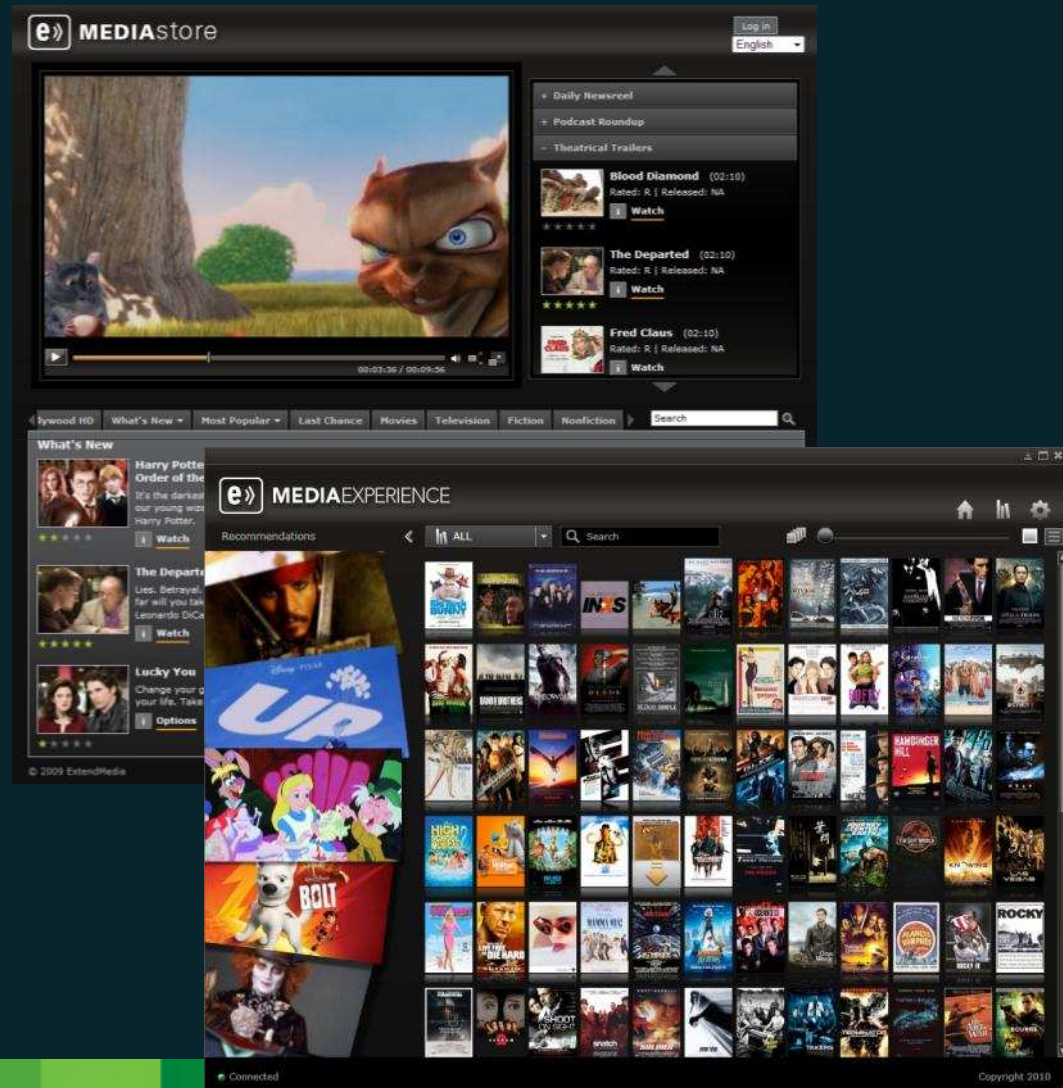- Supports PCs, Macs, Tablets Connected TV, Mobile Phones, Game Consoles
- Customizable UI

Videoscape Common Software Framework

Multiple Presentation Engines *(Flash,HTML5…)*

Cisco Conductor

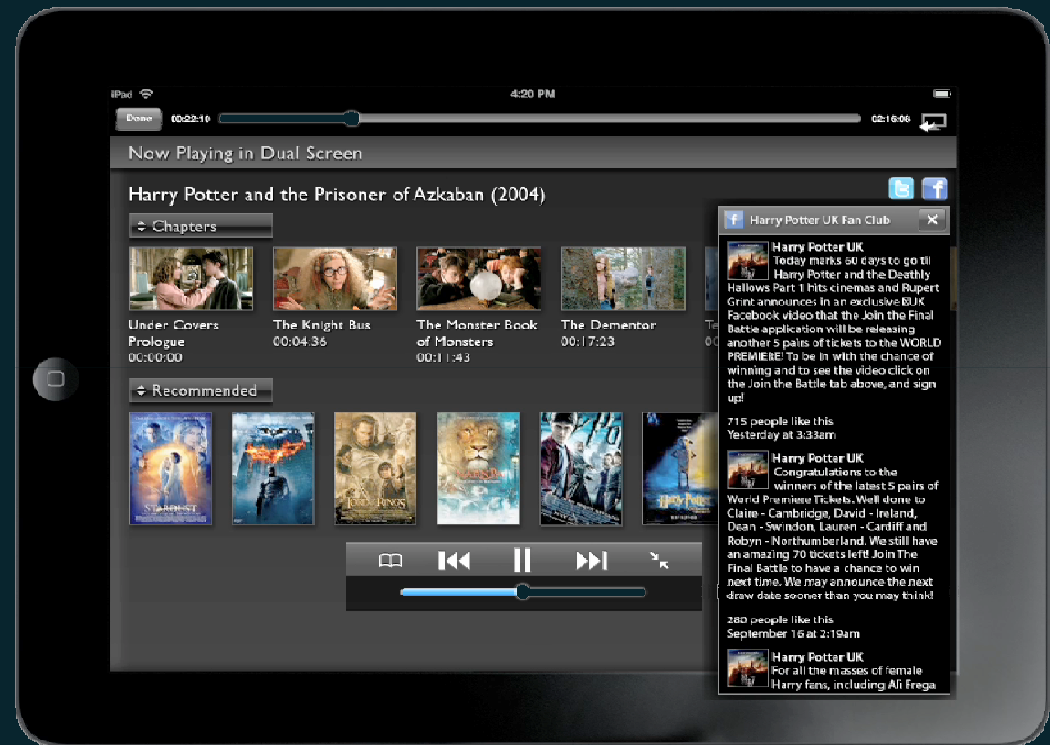# Videoscape
MediaSuite Soft Client & Widget SDK

- In-browser players in Flash & Silverlight

  - Trick play controls, playlist carousel, multi-resolution (std, full, widescreen)
  - Social / Viral – email a friend, embed code for bloggers, post to social networks (MySpace, Facebook, etc.)
  - Video playback, ad insertion & metering
  - DRM support

- Catalog & channel browser widgets for embedding

- Download app provides offline experience
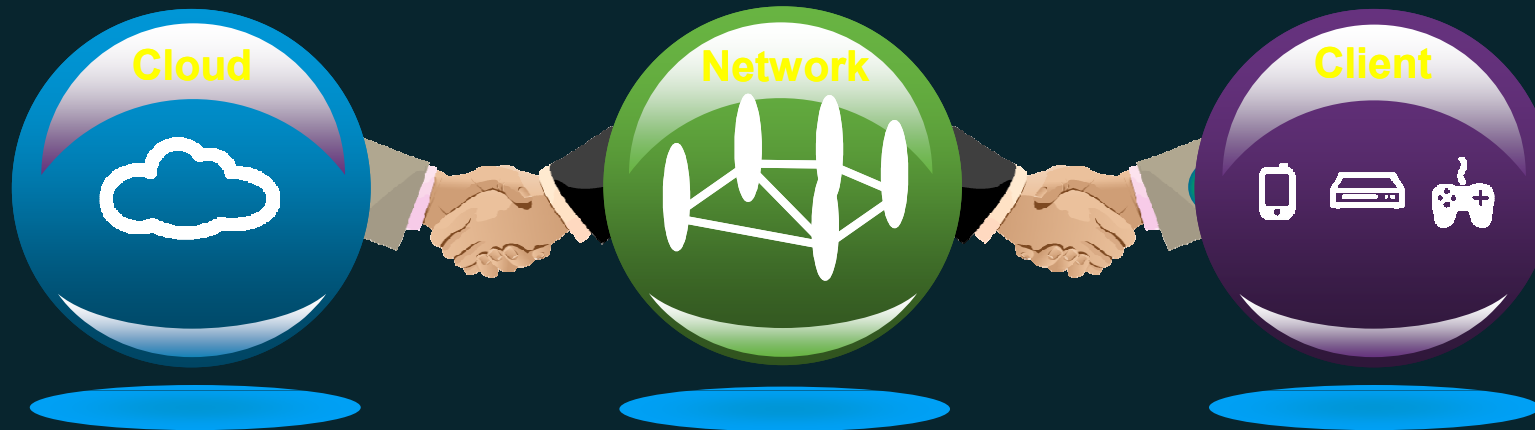
- Full SDK for customization

MediaSuite iPad App

- Service providers expand on-demand/linear solution to unmanaged devices

- Digital Media: TV Shows/Seasons, Movies/vDVDs, Music, Apps etc.

- Linear, On-Demand, "My Digital Locker" (tie in to MediaSuite & Linear module)

- State/history/ personalization in the cloud

    "iPad Companion App" enhances collaboration between Cisco STB/Gateway and 3rd Party devices

- Enhanced social networking integration

- Full SDK to allow for both light & deep customization

Paradigm Shift in Service Delivery
Cisco Conductor for Videoscape: Bringing Cloud + Network + Clients *together*

Cloud — **Network** — **Client**

Cloud platform that enables Orchestration of Services, Devices, and Subscribers over multiple networks

Cisco Conductor

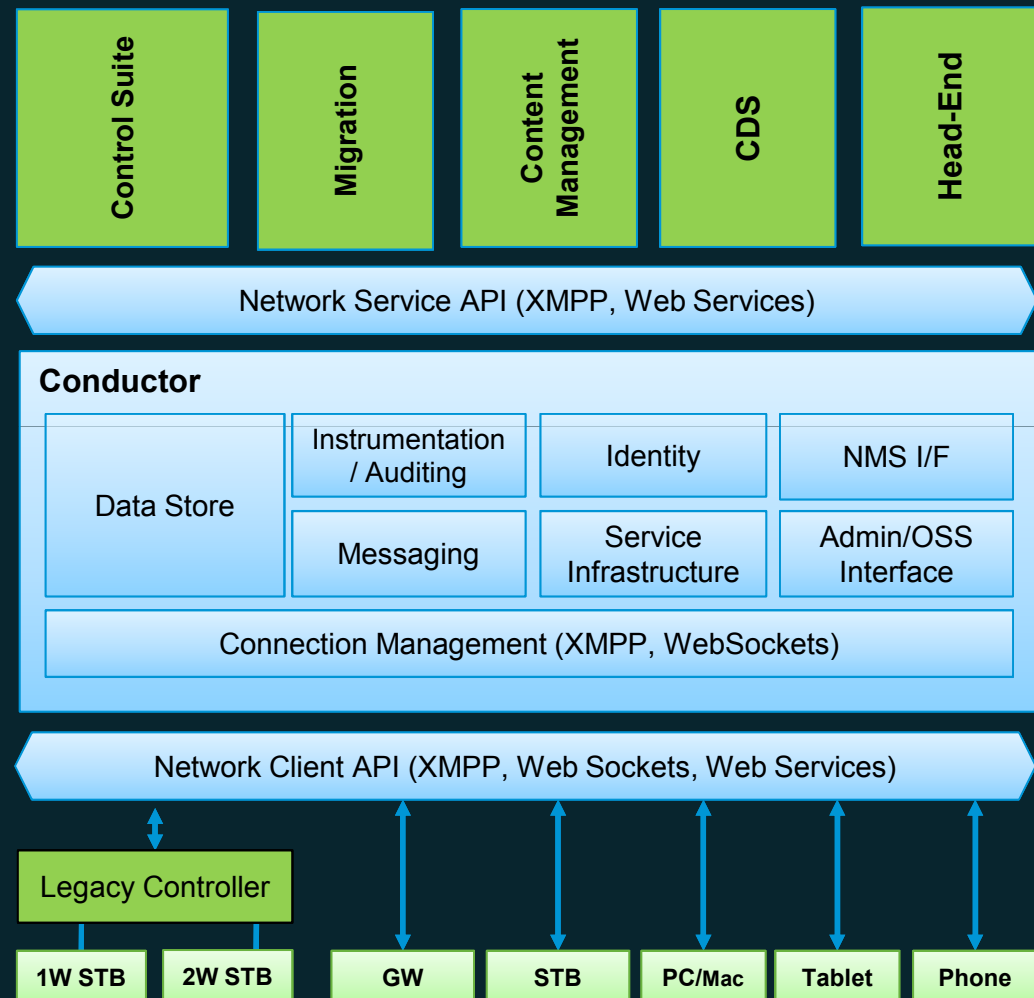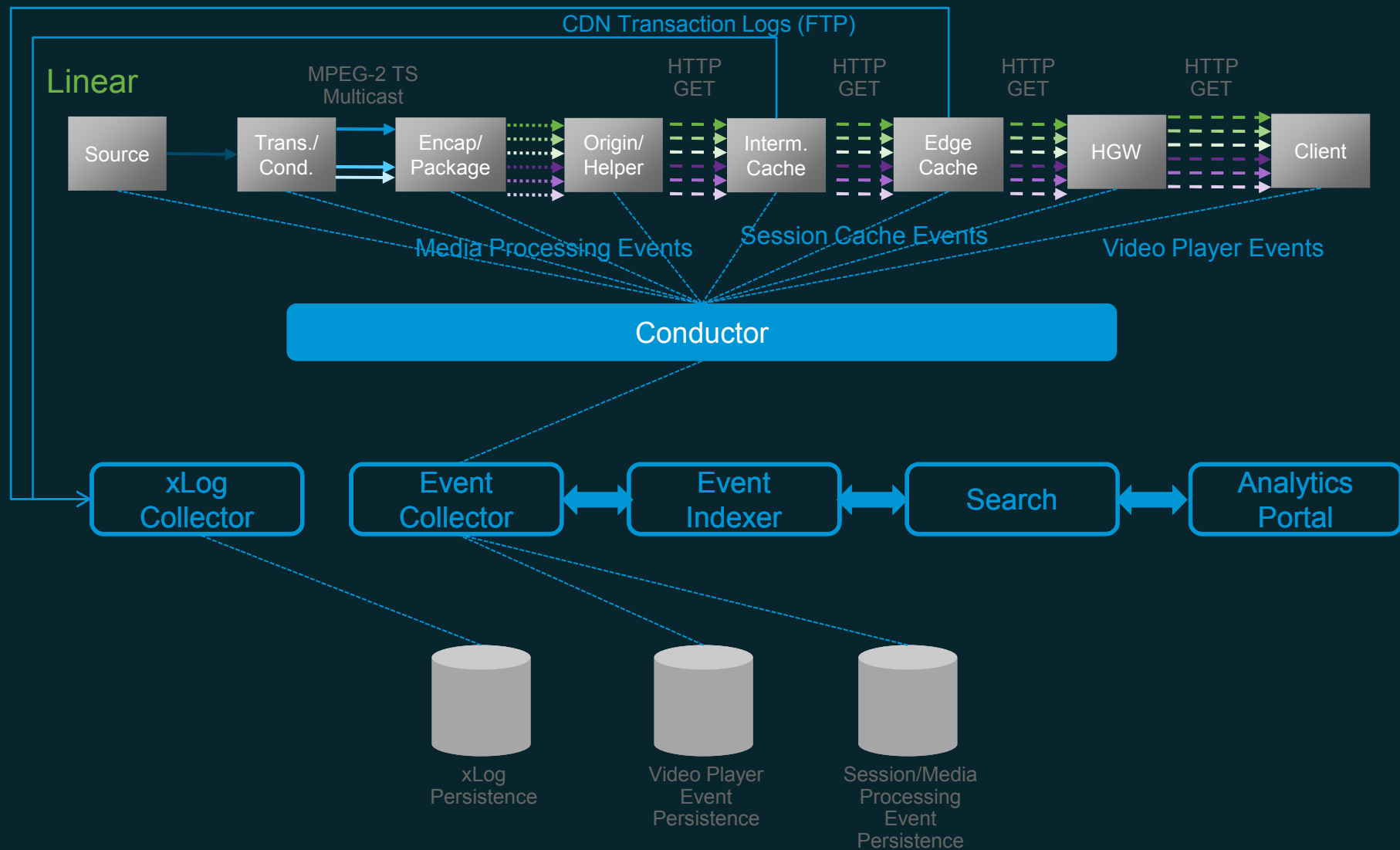| **Connect**	**Leverage Ecosystems**	**Internet Scale,**	**Real-time, Simplicity**
Existing and Legacy Systems to New Systems and Capabilities	Clients can be built in any language: Flash, HTML5, WebSockets, etc	Improved feature velocity with web scale	Simple, Scalable Real-time framework enables Premium services and Provides Social APIs

Videoscape Conductor

- **Connection Management** – Scalable connection management for XMPP and WebSockets sessions

- **Messaging** – Multiprotocol messaging and translation

- **Identity** – Maintenance of device and subscriber identities for message routing and notifications

- **Services Infrastructure** – Enables device signon, provisioning, service discovery/registration, and service/app orchestration leveraging XMPP and WebServices

- **Instrumentation/Auditing** – Enables accounting, billing, analytics, and reporting

- **NMS Interface** – Exposure of instrumentation data and system performance via SNMP

- **Administrative/OSS Interface** – Administrative UI and exposure of key functions through programmatic APIs

- **Data Store** – storage for core Conductor functions

Control Suite	Migration	Content Management	CDS	Head-End

Network Service API (XMPP, Web Services)

Conductor

Data Store	Instrumentation / Auditing	Identity	NMS I/F
	Messaging	Service Infrastructure	Admin/OSS Interface

Connection Management (XMPP, WebSockets)

Network Client API (XMPP, Web Sockets, Web Services)

Legacy Controller

| 1W STB | 2W STB | | GW | STB | PC/Mac | Tablet | Phone |

Videoscape Conductor
Enabling real-time, performance analytics

CDN Transaction Logs (FTP)

Linear

MPEG-2 TS
Multicast

HTTP GET

HTTP GET

HTTP GET

HTTP GET

| Source | Trans./Cond. | Encap/Package | Origin/Helper | Interm. Cache | Edge Cache | HGW | Client |

Media Processing Events

Session Cache Events

Video Player Events

Conductor

| xLog Collector | Event Collector | Event Indexer | Search | Analytics Portal |

xLog
Persistence

Video Player
Event
Persistence

Session/Media
Processing
Event
Persistence

Videoscape Portfolio

Media Suite

| Unified Content Management | On-Demand & linear entitlement | Digital Content Locker | Publishing/ Product Catalog |

Conductor

| Real-time Controls/ Linear Svc Mgt. | Fine Grained Session Mgt. | N-Screen Service/ Rights Management | Cross Platform Device Mgt. | Services SDK. |

Acquisition Suite

- Linear Transcoding & ABR Packaging
- VOD Transcoding / Workflow
- ABR Encapsulation

Virtual Origin Services

Distribution Suite

- Dynamic ABR Ingest & Optimized Caching
- Service Routing
- Optimized HTTP Streaming
- Proxy Caching

Clients

- Videoscape IP and Hybrid End Points
- Videoscape Media Gateways
- Videoscape Soft Clients

Migration Suite
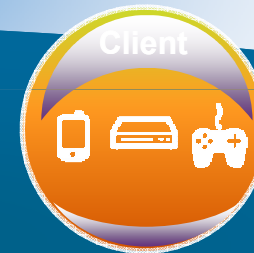
| Virtual STB in the cloud | Companion Adapters | Legacy system linkages |

SPs at Crossroads
Competitiveness Vs. Investment Protections

Competitive Pressure for New Integrated Experiences

Cloud

Network

Client

Backend System
Existing high investment in backend and middleware

VoD System
Monolithic legacy systems lack scale & multi-screen flexibility

IP Infrastructure
Huge traffic growth Multicast to Unicast
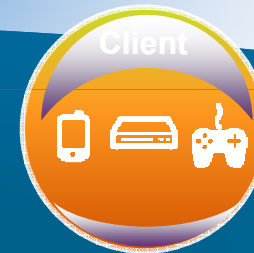
STBs
Existing high investment In legacy STBs

SPs at Crossroads
Competitiveness + Investment Protections

Competitive Pressure for New Integrated Experiences

Cloud

Network

Client

Backend System
Existing high investment in backend and middleware

Leverage & integrate experiences and lifecycle with existing backend

VoD System
Millions in legacy systems

Multi-screen capacity scale, efficiency, bandwidth savings - pay for only new investments

IP Infrastructure
Huge traffic growth

Strengthen, scale and virtualize intelligence Multicast to Unicast

STBs
Existing investment in legacy STBs

New Experiences reach legacy STBs & new STBs in new markets & consumers

Preserving the Value of Current Investment

5 Phase Deployment Blueprint: OPTIMIZE & MONETIZE

5

NG Service Management and Real-time Apps

Cisco Conductor for Videoscape - Higher resiliency & Ultra-scale
Next Generation Applications - With real-time info

4

New Lifestyle Applications

Videoscape Media Gateways - Efficient media distribution inside home
Enter adjacent markets with lifestyle applications
Nexus & UCS - Virtualization for scale & efficiency

3

Jump-start Integrated Experiences

Videoscape Migration Portfolio - Support integrated applications on legacy STB
Videoscape STB- Unmanaged & managed content to TV with hybrid / IP STB

2

Expand the reach beyond TV, Gain Efficiencies

Videoscape Media Suite & Videoscape Soft Clients– Offer TV Everywhere
CDS-IS/AVSM - Gain CDN distribution efficiency & scale, Better experience
CDS TV - Leapfrog Legacy VoD system limitations with distributed architecture & scale

1

Strengthen IP Foundation

IP Core with Optical - Scale IP infrastructure
DOCSIS 3.0 – Expand the IP foundation for high-speed IP services

Thank you.