



Shape Your Business For the Future:

Powering Transformation With Cisco

Monetizing Broadband

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June 12 2012

Agenda

Market Trends

Global Broadband Monetization Examples

Cisco Solutions for Broadband Monetization



Asia Pacific - Data deluge

IP traffic **4x**

11

2011 EB/mo

40

2016 EB/mo

1.7B

Internet Users



8.7B

Networked Connections

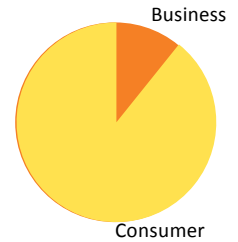


93GB/mo

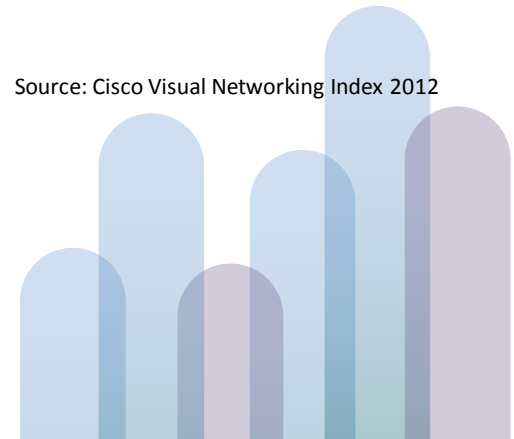
Internet traffic per household

>85%

Consumer traffic



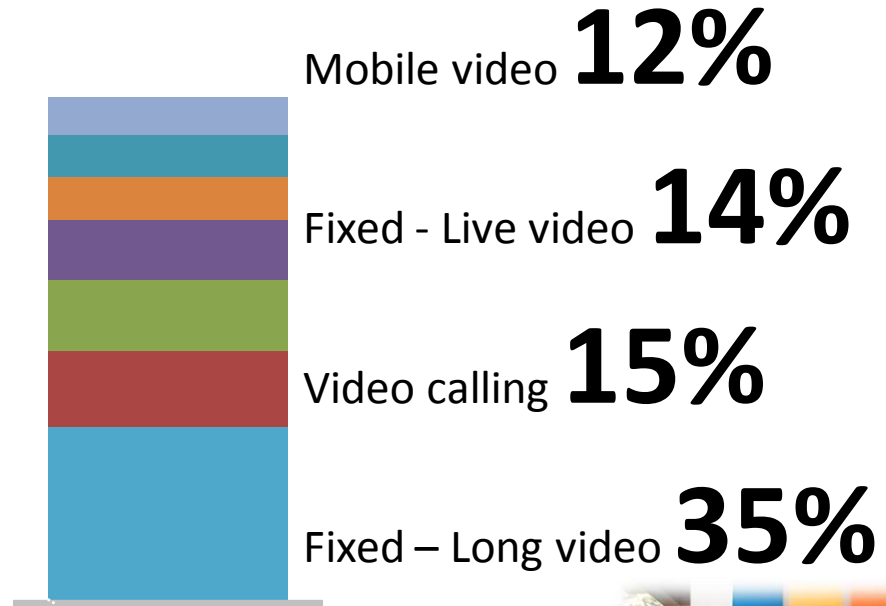
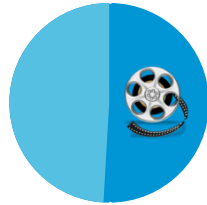
Source: Cisco Visual Networking Index 2012



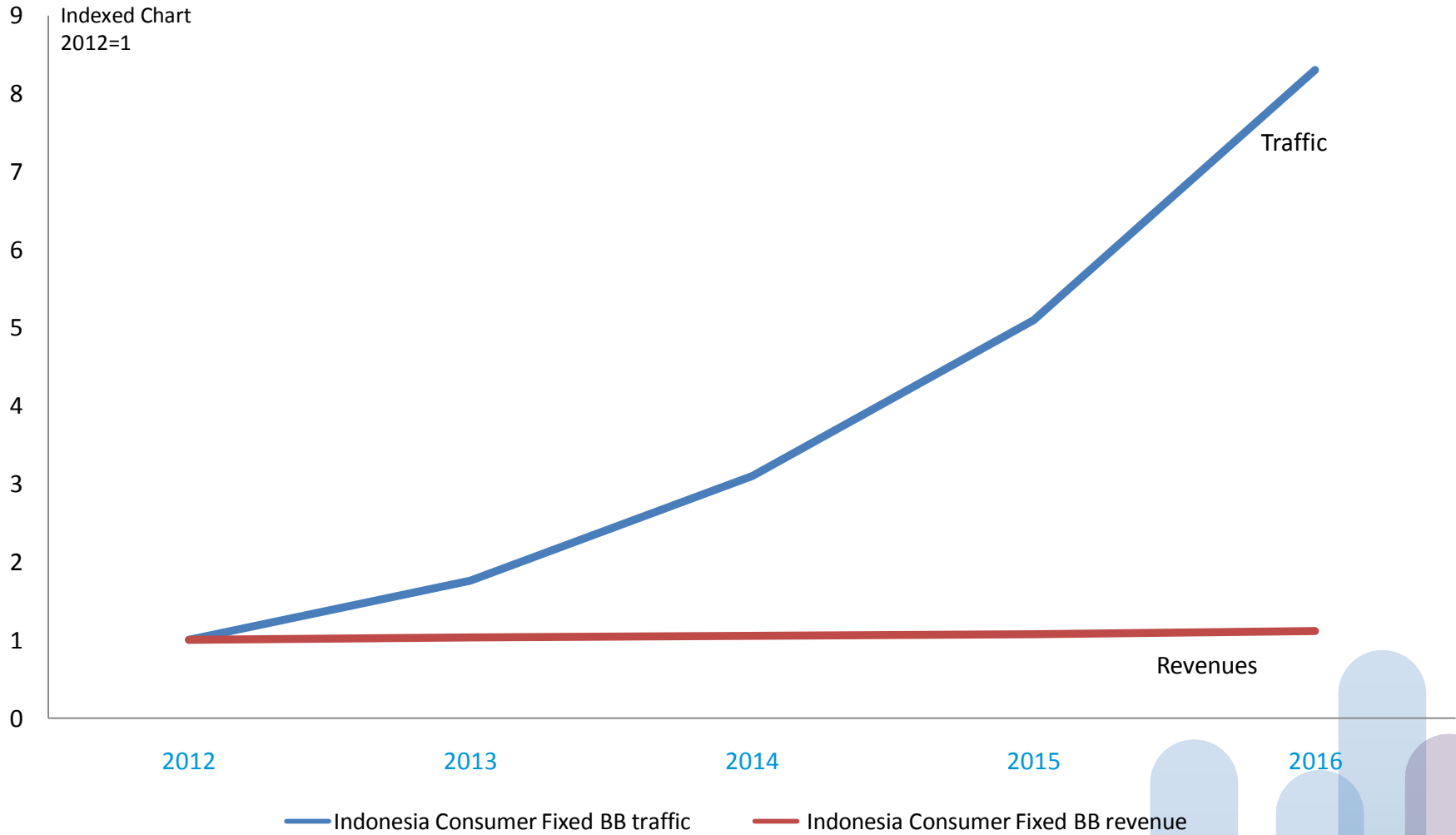
Asia Pacific – Video dominates



Video is **50%**
of IP traffic



Era of selling bandwidth is over



Source: Ovum & Cisco

Bandwidth to Services Transition Needed **INNOVATE**

Service with a full range of exclusive channels and videos!

Movies!
TV dramas!
Sports!



* To use HIKARI TV, a contract with NTT Pala Inc. and I-Cast, Inc. is required in addition to the contract with FLET'S HIKARI (contract charges, installation charges and monthly charges will apply).

* Available channels and titles may differ depending on the service and plan contracts that the user subscribes to.* For displays based on the Specified Commercial Transaction Law, a pamphlet with details can be sent upon request. Please make a request by e-mail or phone. [E-mail address] support@hikariv.net [Toll-free] HIKARI TV Customer Center 0120-001144 (Office hours 10:00 am to 9:00 pm, open seven days a week)

Exclusive Channel

Video



	Basic	Superior	Ultimate
Downlink speed	4 Mbps	10 MBps	50 Mbps
Uplink speed	1 Mbps	2 Mbps	8 Mbps
Monthly cap	20GB	None	None
Price	\$44.95	\$54.95	\$79.95

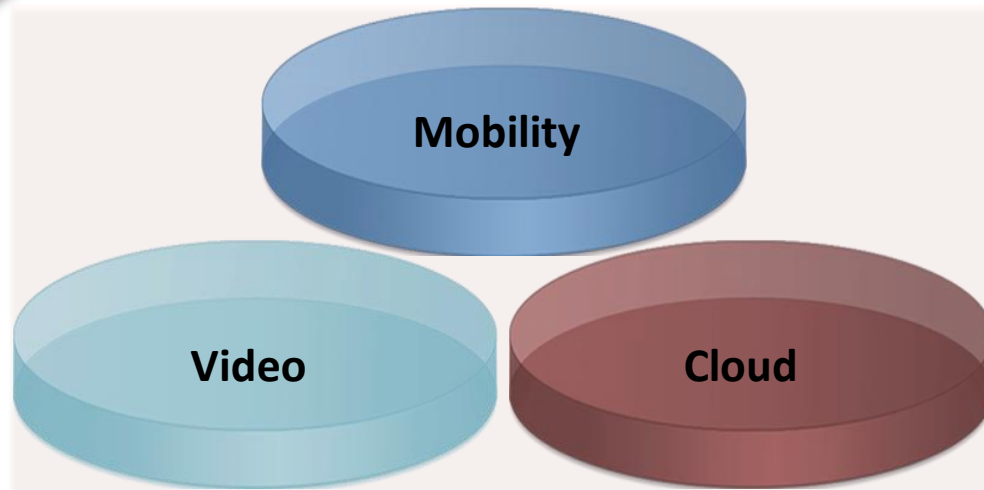




Enterprise



Machines



Consumer

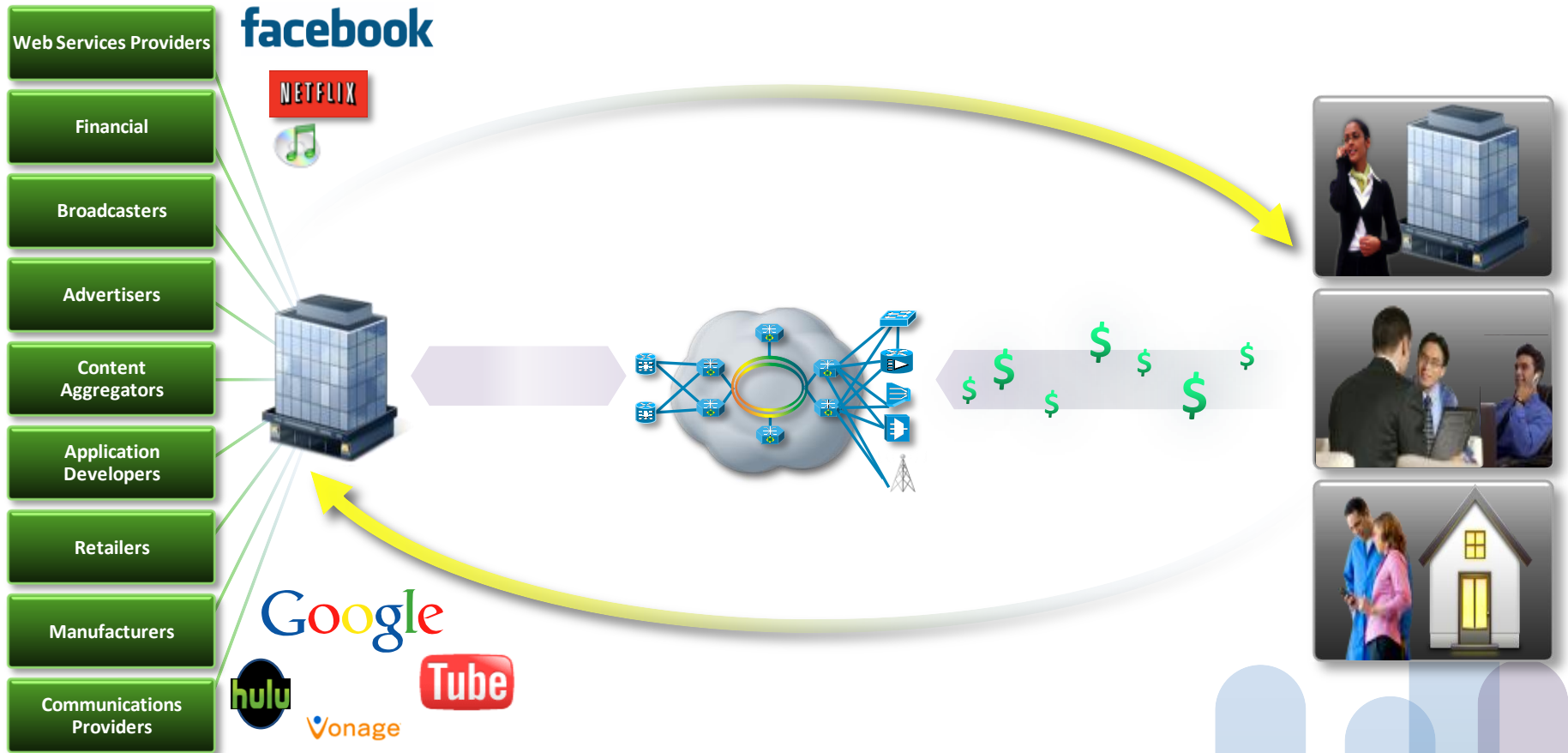
Gov/Public Sector
Edu/Healthcare



New opportunities are market specific, focused services

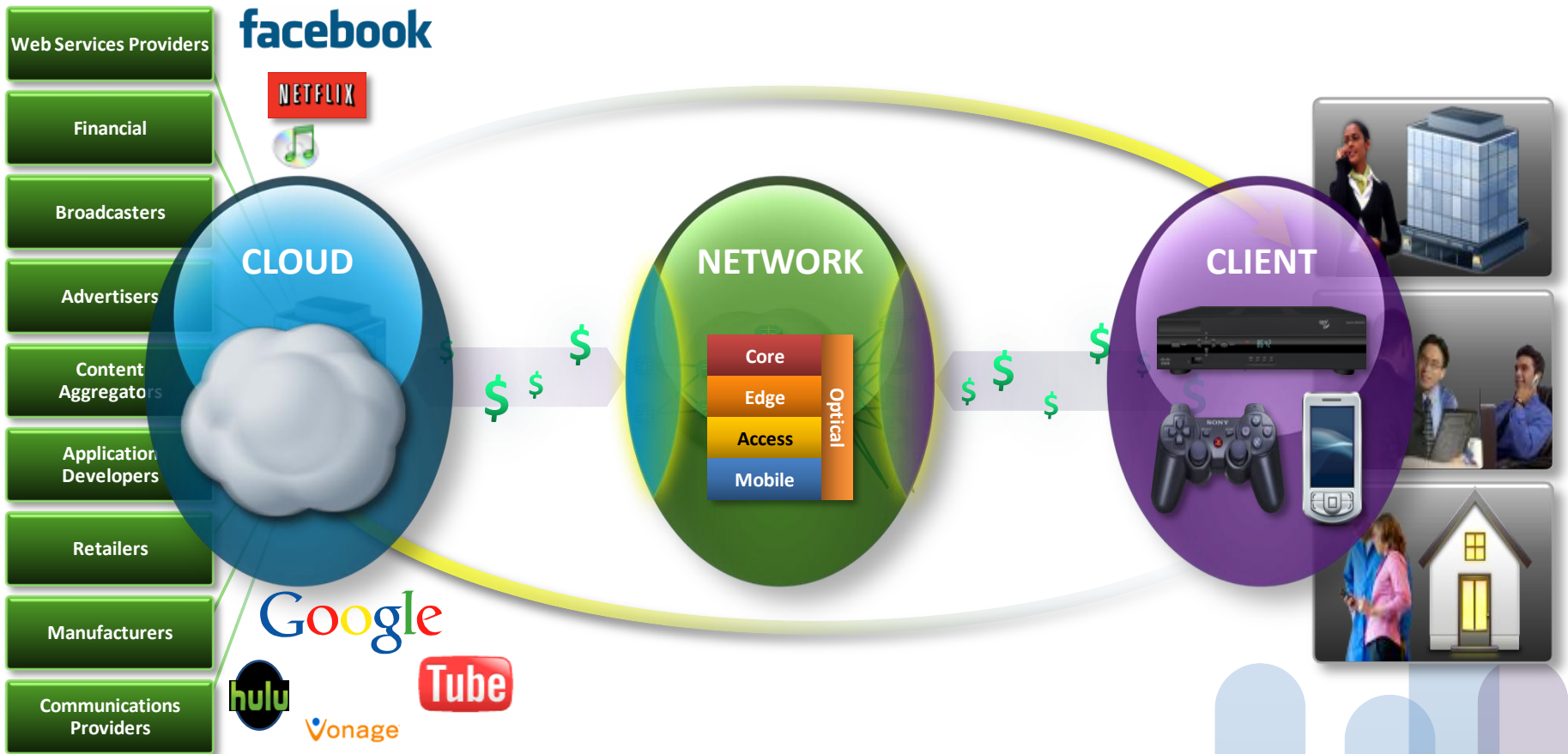
OTTs are seizing the new opportunities

INNOVATE



Use cloud and network intelligence to create new business models

INNOVATE



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Utilize network intelligence to locate and route content optimally

Integrated CDN + IP network offering

On-demand content distribution

Real time live events

Dynamic scalability



CDNs to capitalize on video growth

Movies & TV Shows On demand

N-screen – Content delivery to TVs, PCs, T-Box, Xbox

PVR with T-Box (Set-top box)

Optimal Delivery using Telstra CDN



CDN based On-demand video



Optik TV service

Enhanced with Optik On The Go

- PVR anywhere
- 500+ channels
- 100+ high-definition channels
- N-screen service

Cloud based hosted video delivery services

~500000 subscribers

Cloud based TV - Anywhere, Any device





IP NGN

KiBot - Android powered Kids Robot

>10000 books, instructional videos

Video monitoring of children

Powered by Cloud

Service - US\$14/mo

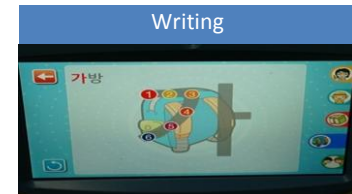
KiBot HW – US\$26/mo

Education

Safety

Learn English

봇



Cloud powered E-Learning - KiBot

Second Trial of Cloud-based Translator
Phone Service
10 languages and 10,000 users

*translator phone service utilizes DOCOMO's "network cloud," which **integrates** the company's **cloud and mobile** network resources to handle the heavy processing required for rapid real-time interpretation*



Mobile Cloud – Language translation

Gardening Social Network

Freemium - Basic service free.

157Y/mo for expert horticulturist advice and accurate weather info

N-screen service – Mobile + PC



Mobile Cloud – Long Tail Social Network



IP NGN

Olleh ucloud

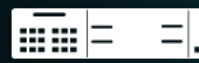
Music, N-screen Network DVR,
Files, Email

Freemium – 50GB packaged
with broadband

Paid upgrade up to 300GB



Personal Cloud



Unified RAN
Backhaul



Packet
Core

User wants to watch a video

User is prompted with a SMS

- Watch Ad = Free
- No Ad = Charge

Policy (e.g., QoS) for the subscriber flow is sent down for enforcement

User accesses the content with the updated QoS for the time period



Upgrade quality for \$.99?



Quality upgraded

Mobile Video Turbo Boost Instant Gratification with Bandwidth on Demand



Next Gen Hotspot




Packet Core

Traditional hotspot

Guest Access

\$5-\$9 /month




Hotspot
Wi-Fi Connectivity



Next-generation hotspot


Location Analytics

\$200-500 /month




Mobile 3G Offload

\$2-5/GB



Guest Access

\$5-\$9 /month



Managed Wireless LAN

\$10 / AP / month



Hotzone / Hotspot Wi-Fi Connectivity



NG Hotspot – New Business opportunities



Next Gen Hotspot



Packet Core



M2M

- Connecting meter reading, digital signage, sensors...
- Monthly fees per machine or usage
- \$2-4/con. /month



Subletting

- Large venues access (malls, stadiums etc.)
- Revenues from managed Wi-Fi
- \$50/AP/month



Advertising

- Access to hotspots
- Subsidized by ads & sponsorships
- CPM-based charge
- \$0.5-1/user-month



Embedded Connectivity

- Devices sold with free Wi-Fi access
- E.g. Kindle model
- Charge content / device manufact.
- \$0.5/download



Retail Store Interactions

- Targeted market offers
- Enhanced in-store experience
- Revenues from set-up, consulting, integration and monthly fees
- \$100-150/store/month

B2B Service Provider selling through other businesses

3rd Party

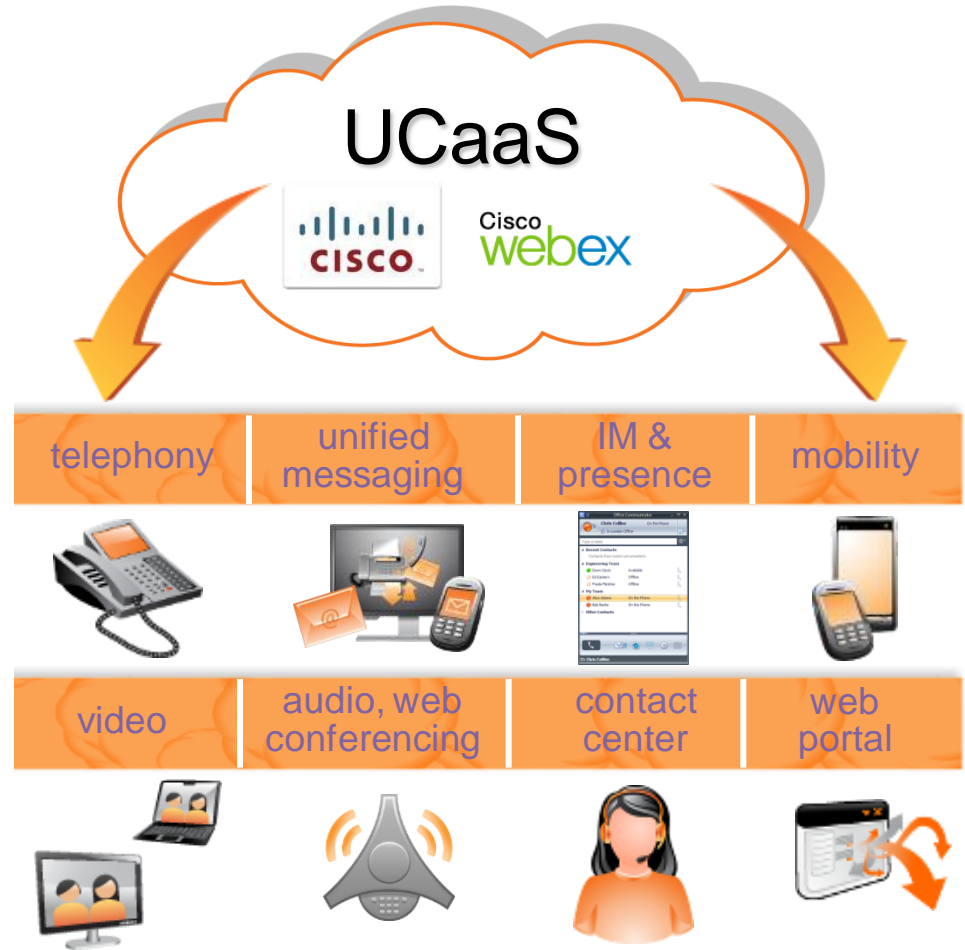
M2M
Concierge
Advertising

Venue Owners

University
Stadium
Municipality

SP WiFi – Value added services

- Rich collaboration applications
- Easy to use portal to select profiles for your users
- “Pay as you grow” pricing
- No CapEx
- Scale up or down based on your business needs
- Fully managed cloud solution
- End-to-end SLA



Cloud Based UC as a Service



Subscription fee : \$30/mth (2 years contract : \$10/svc, \$20/pad)

KT provides Smart Home Pad(Galaxy Tab 8.9" WiFi)

Home Security(\$5/mth) : Optional Telecop service

Smart Home Voice : 100 m free including video call

Smart Home Play : File Sharing by DLNA

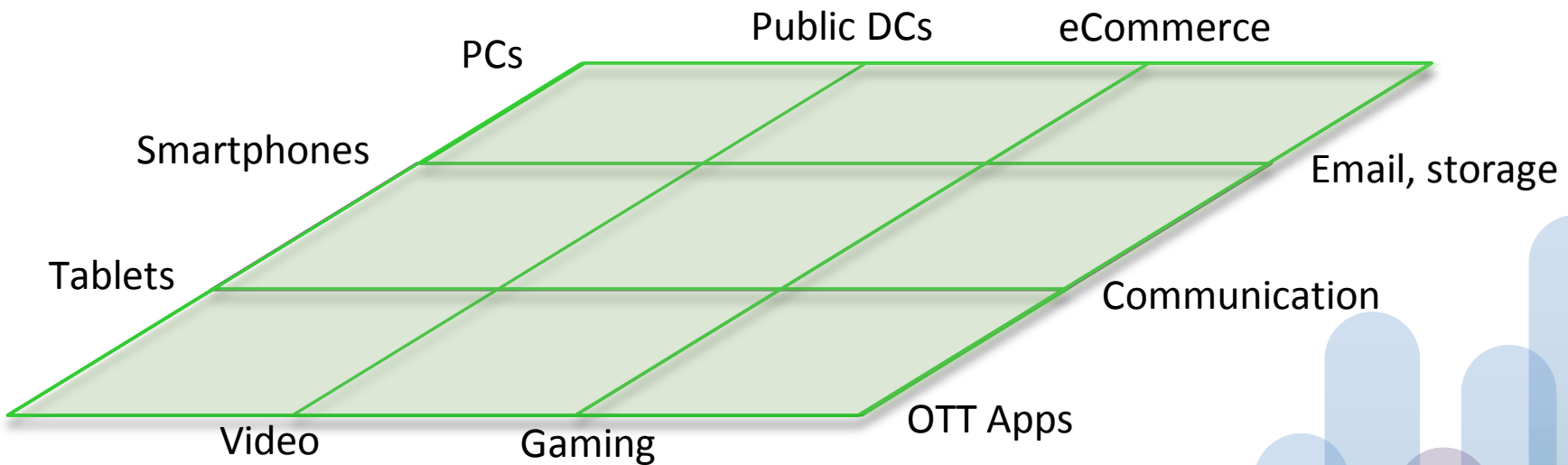
Olleh TV now
11,000 VOD contents
40 Realtime TV channel

Home Automation(on the roadmap)

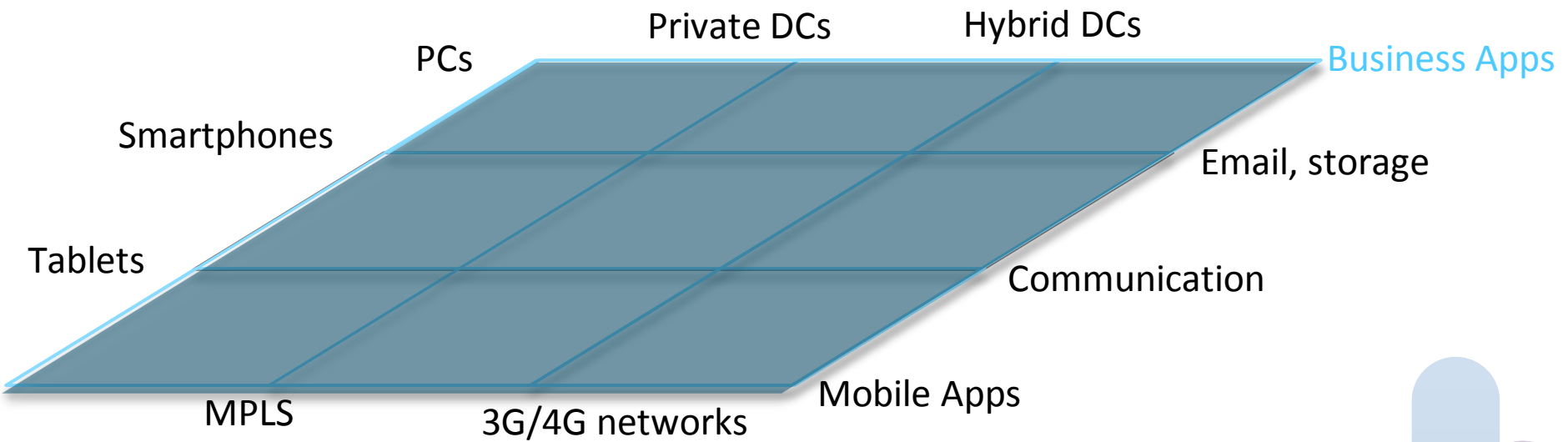
Smart Home



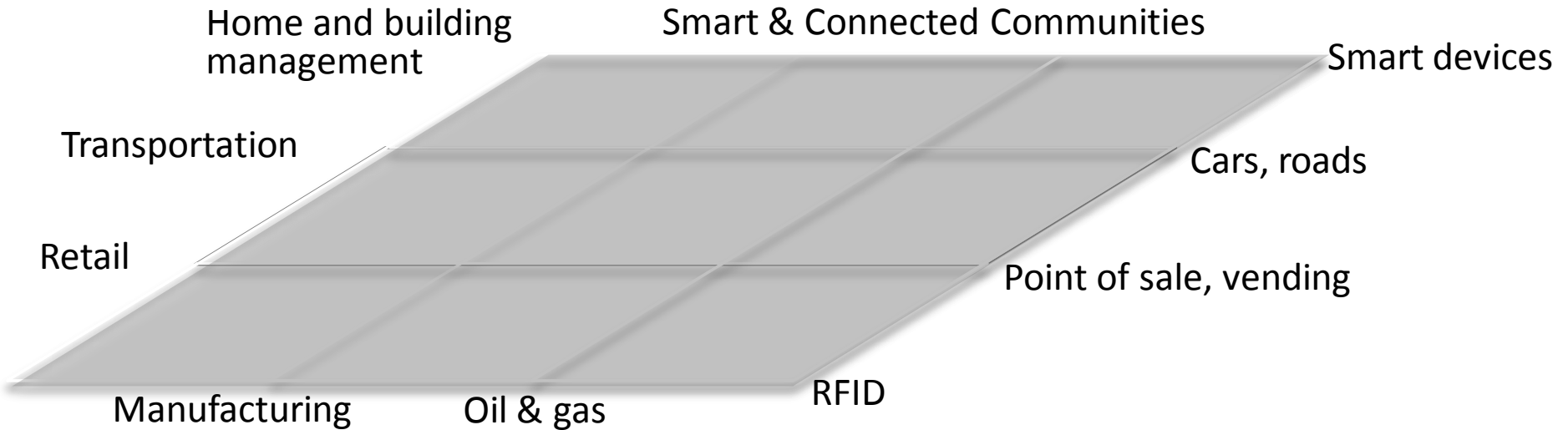
Public Internet and Applications



Business Networks and Business Applications



Industrial Internet (sensors and M2M) INNOVATE



M2M Market Mobile Business Services

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Consumer Aftermarket Telematics



Consumer OEM telematics



Vehicle & container tracking

Telematics

Telemetry

Wireless Local Loop



Automatic Metering Infrastructure



Fixed Wireless Terminals

\$20B¹
by 2014



ATM/POS



Industrial PDAs

Western Europe

Eastern Europe

Middle East / Africa



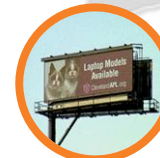
Remote Monitoring & Automation



Security



Telehealth



Remote Information Displays

ABIresearch

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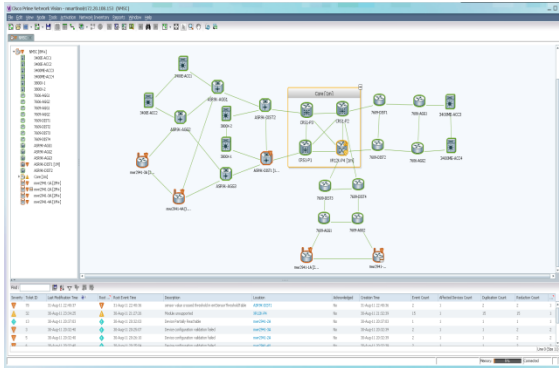


Cisco ASR 9000 System

Leadership with a Scalable End to End Portfolio

IN **TE**

Cisco PRIME Management



ASR 9006

ASR 9010



ASR 9000v



ASR 9001



Lower-End
Aggregation

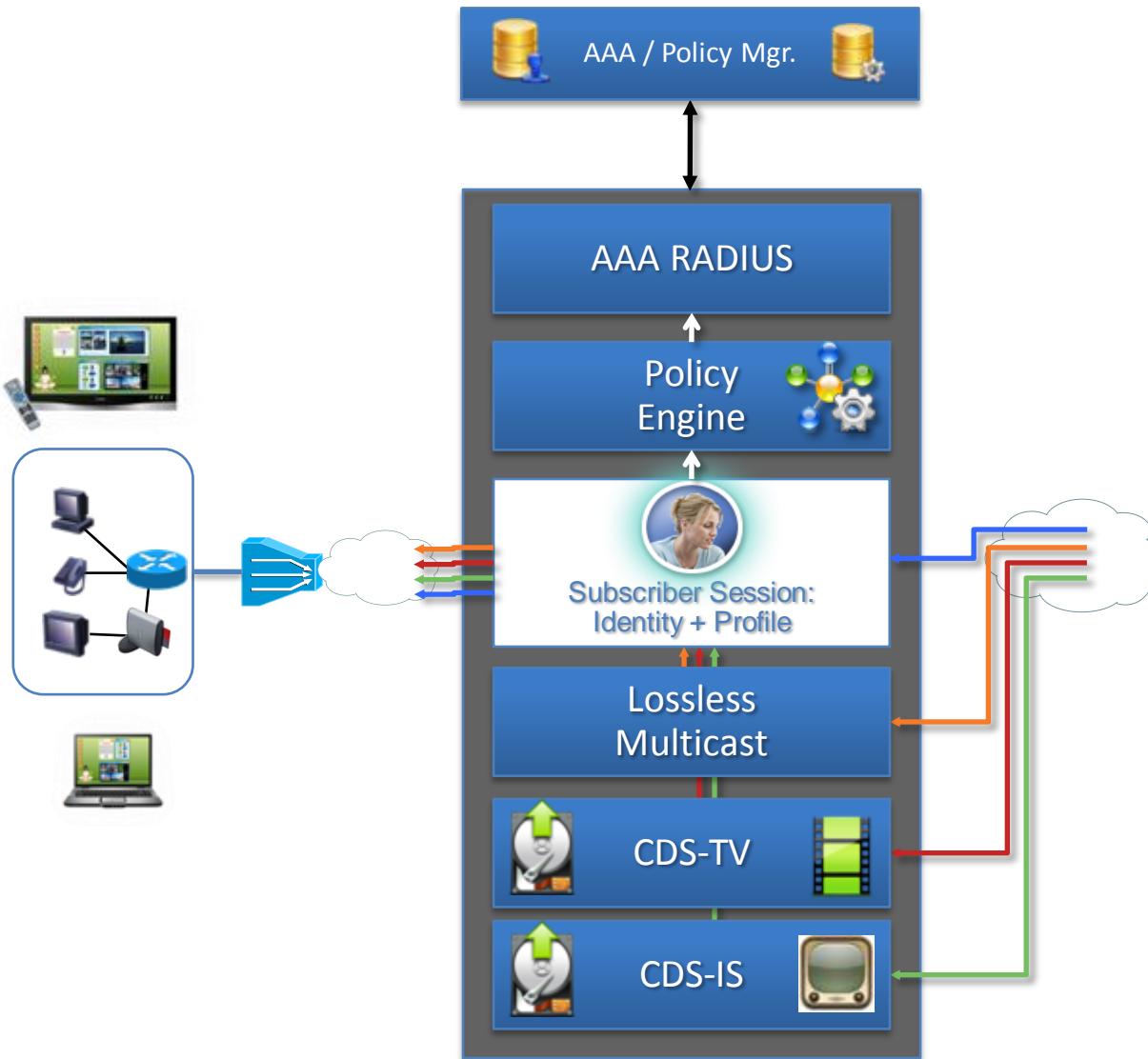
Edge Aggregation

Edge Aggregation

Large-Scale Edge

ASR 9000 – The “Medianet” BNG

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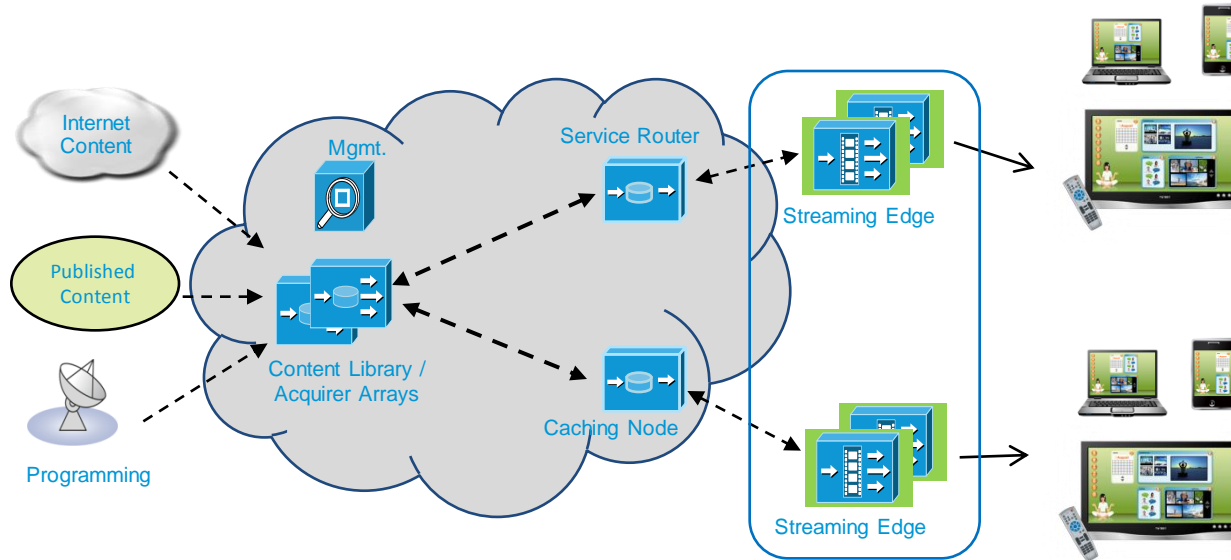
Subscriber Termination
Scalable PPPoE & IPoE, AAA
v4/v6
Multicast Aware PPPoE

Quality of Experience
Video Monitoring
Highly Scalable QoS,
MoFRR / Live-Live Lossless Multicast

**Optimized Service Delivery
& Operations**
BNG & ISM Integration + Testing
CDS VOD and Internet
Streaming, Caching
VAMS Integration

Integrating video streaming in the edge

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Efficiencies of the Datacenter



Unified Fabric



Datacenter Storage



Cisco CDEs

Cisco UCS

- Storage, shared infrastructure, management, virtualization

Closer to the Edge



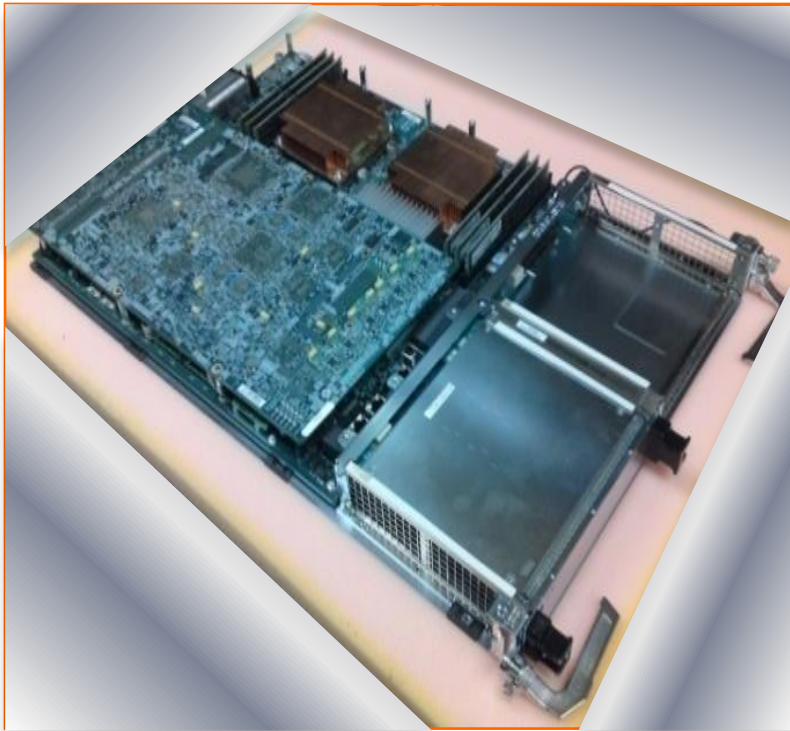
Cisco CDEs



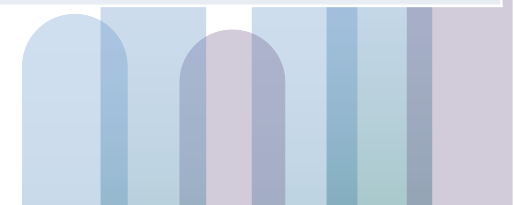
ASR9000 with ISM

- Highly optimized, environmental specific platforms AND
- Integration of streaming functions within Cisco edge Routers

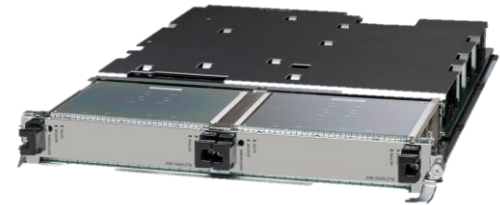
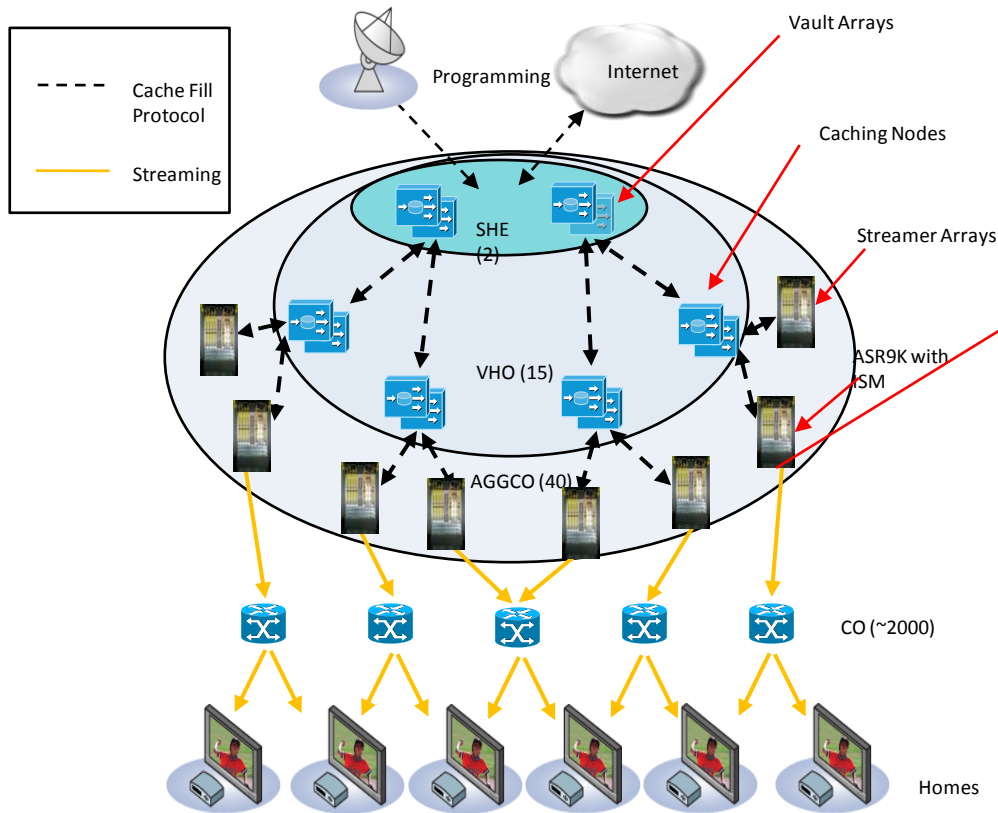
Integrated Service Module – ISM



Feature	ISM-IS Capabilities
Applications	Ultra-Dense Internet Streamer for VoD and Live
Bandwidth	30 – 40 Gbps streaming capacity, protocol dependant
Compatibility	Interoperates with CDE appliances
Content Cache	3.2 TBytes at FCS - Modular Design
Video Formats	Windows Media RTSP, Adobe Flash RTMP, QuickTime RTSP, HTTP PDL, HTTP ABR (Apple, Microsoft, Adobe)
Advanced Features	Unicast Error Repair (future release)
Physical	Single slot of ASR9000
Environmental	NEBS / ETSI compliant



CDS-IS with ASR9K ISM



Converged

- Integrated application intelligence into the ASR 9000 System
- Reduced footprint, power and cooling

Flexible

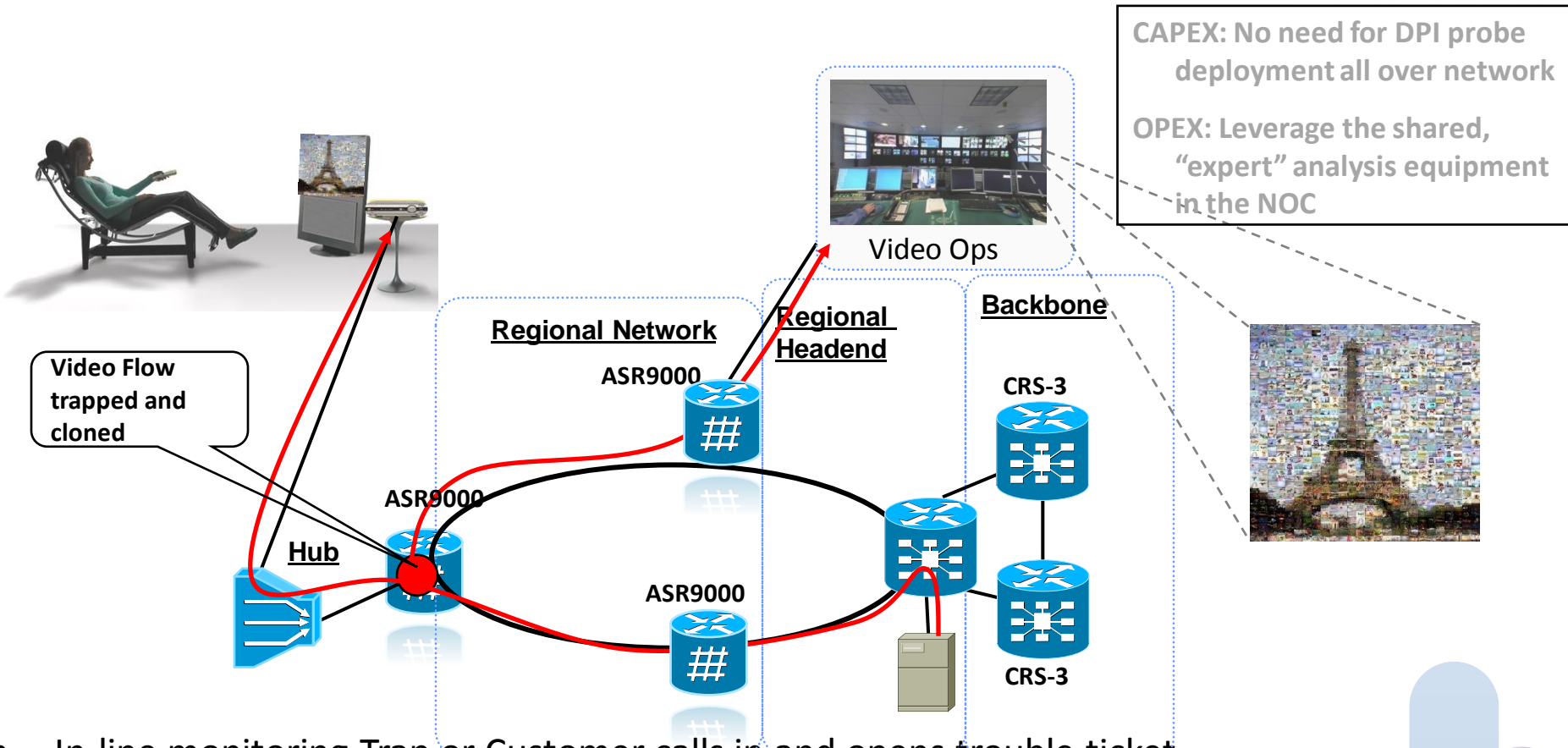
- Use with existing CDS deployments
- Integrated with NPS
- Enable CGv6
- Ultra-Dense VoD, TV,
- Internet Streaming, Error Repair, NPS

Scalable

- Pay as you grow modular investment
- 3.2TBytes Contents Cache
- 30-40 Gbps streaming capacity
- ~3 Gbps cache fill rate
- Up to 8,000 SD equivalent

Edge - Integrated Video Monitoring

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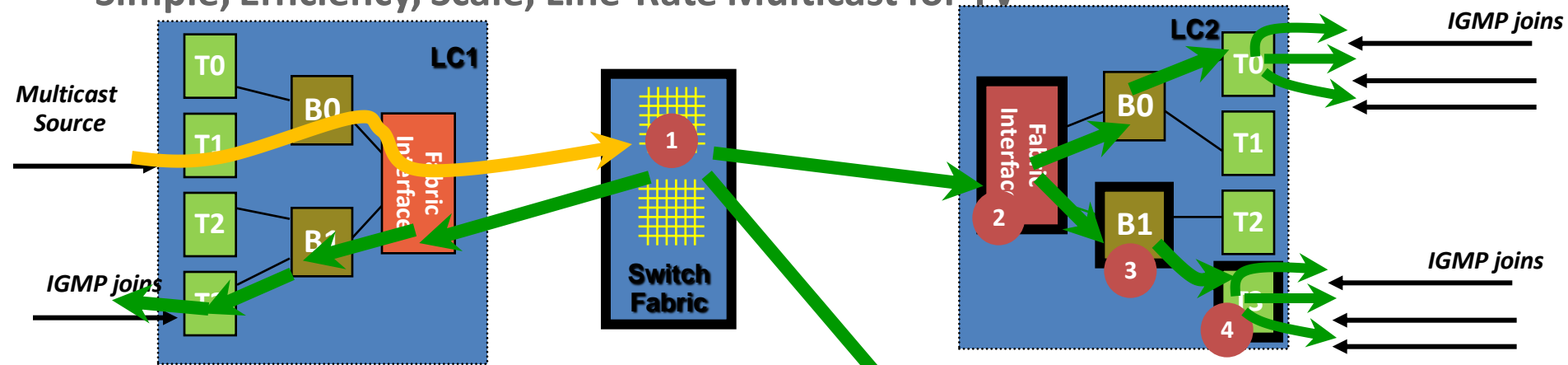


- In-line monitoring Trap or Customer calls in and opens trouble ticket
- Service personnel trap the Video flow and clone it
- Video Flow transported to Video Operations Site for detailed codec level Analysis / Troubleshooting

Superior Multicast Architecture

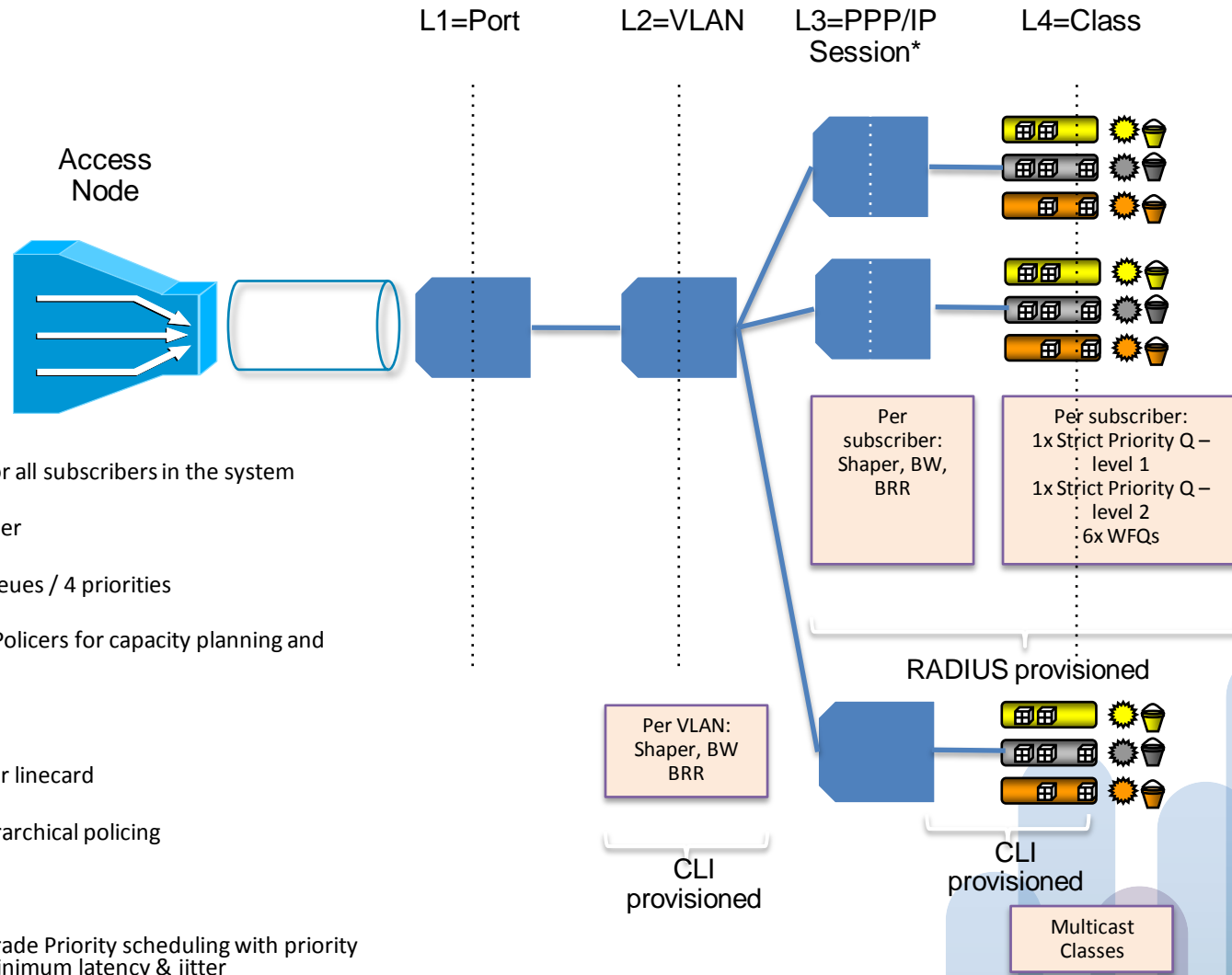
Simple, Efficiency, Scale, Line-Rate Multicast for TV

INNOVATE



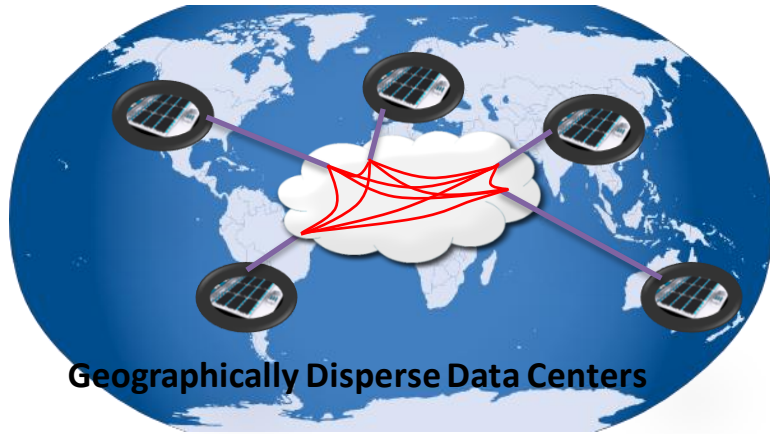
- **Efficient Multicast Replication**
 - Replicate the packet **ONLY** if it is necessary
 - Fabric and egress replication
- **Line Rate Multicast Replication with Scale**
 - All replication ASICs can do line rate mcast replication in HW without any bottleneck
 - Line rate Multicast replication and performance is independent of the number of mroute, interface, or system load
- **Architecturally Simple**
 - Uniform mcast forwarding for both L2 and L3 mcast
 - Uniform mcast forwarding independent of the source and receiver LC/port (ex, no local switching)

BNG Hierarchical QoS (4-level)



- Hierarchical SLA for all subscribers in the system
- 8 queues/subscriber
- 3 Strict Priority queues / 4 priorities
- Aggregate Traffic Policers for capacity planning and disaster insurance
- Scalable WRED
- 64k subscribers per linecard
- 2R3C policers, hierarchical policing
- 4 layers H-QOS
- Voice and Video grade Priority scheduling with priority propagation for minimum latency & jitter

Enabling Large-Scale Distributed Data Centers



DCI: Make many physical data centers look like one logical data center

- Distributed applications closer to users
- Business continuity
- Seamless workload mobility
- Pool and maximize global resources

Perf

- High 10GE density with line rate perf
- Cost effective and energy efficient

Scale

- L2: MAC, VLAN, Bridge Domain, PW
- L3: FIB, ARP/ND Scale, MPLS-TE

Resilient

- Fast convergence & fault isolation
- Load balancing: per VLAN/per flow

Mobility

- Seamless workload mobility
- L2 mobility (L2 Extension) & L3 (LISP)

ASR 9000: The NG DCI Platform



Ultra-High
10GE/40GE/100GE
Density

- 720x10GE in CY'12
- 48T system capacity
- Up to 2.4T/slot (2x1.2T)
- Flexible system portfolio (2~44 RU)

Ultra-High MD
Service Scale

- Distributed OS: IOS-XR
- Scalable L2/L3 VPN, BNG, Video Services

Carrier Class

- Granular Modular OS
- Advanced Fabric QoS & Multicast Replication
- Superior Resilience Solutions

CRS Evolution

A Future-proof Architecture



2010

2011

2012

2013

2014

CRS-3 SC
140Gbps/slot
4.48 Tbps

CRS-3 MC
9+1
40.3 Tbps

CRS-3 B2B
2+0
8.96 Tbps

400G SC
400Gbps/slot
12.8 Tbps

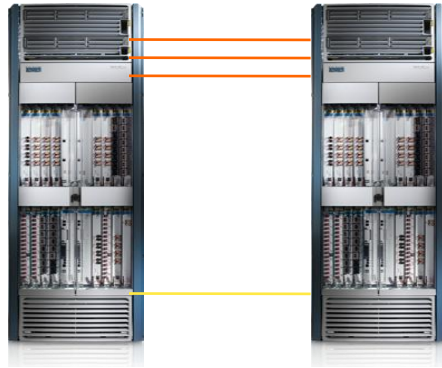
400G B2B
2+0
25.6 Tbps

400G MC
9+1
115.2 Tbps



- Cisco continues to invest in CRS and driving to 400G density on the platform
- Future-proof architecture (forwarding-, switching-, control-plane separation) allows hitless evolution from 40G/140G/400G and from single-chassis to B2B and multi-chassis
- Co-existence of three LC generations in the same chassis leveraging CRS future-proof architecture

CRS B2B & N+1 Multi-Chassis



B2B MC



**CRS3
FCC**

**CRS3
LCC0**

**CRS1
LCC1**

**CRS1
LCC2**

**CRS3
LCC3**

- 2+0 Multi chassis system without a Fabric Chassis
- SuperStar Asic in S13 mode instead of S1S3 mode
- Fabric Connections are made back to back from one LCC to another LCC.
- Hitless upgrade from B2B to 2+x system for future expansion and without having to replace the fabric cards

- Fabric chassis must have all CRS-3 Fabric cards
- Backward compatibility with CRS-1 MC
- Line card chassis can have all CRS-1 or all CRS-3 fabric cards.

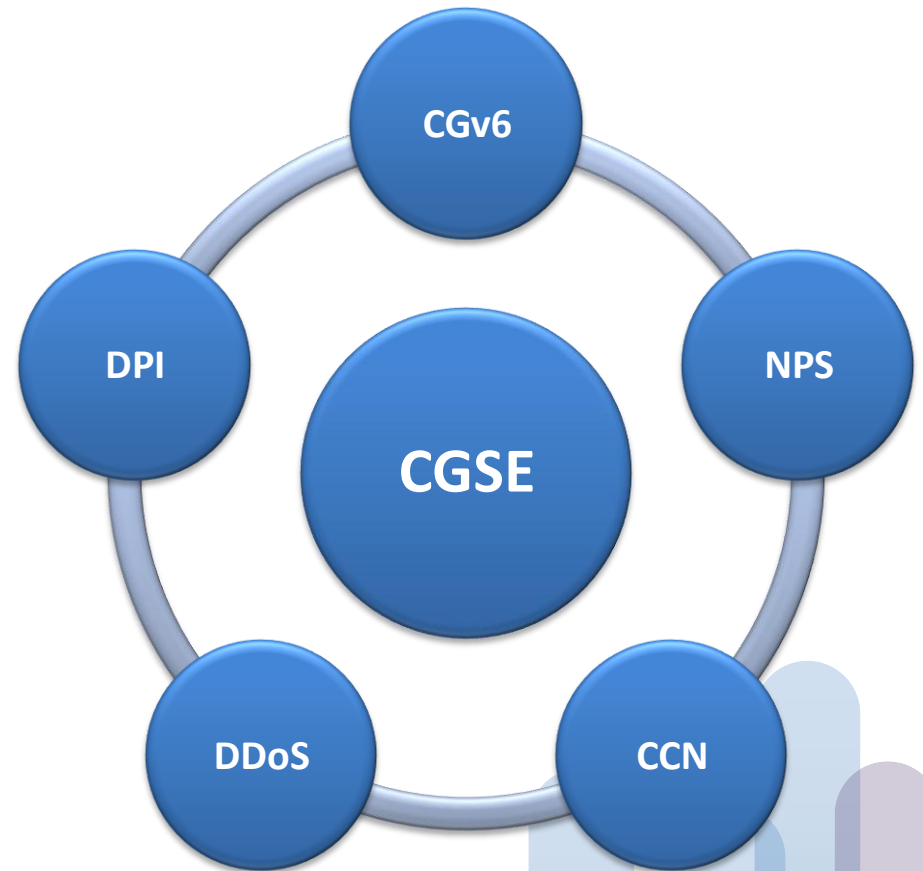


CRS Carrier-Grade Services Engine

Enabling IPv6 Transition and SP Services



- **20Gbps** of throughput, **20M NAT** states, 1M connections per second on 1st gen CGSE
- **80Gbps** of throughput **60M NAT** states on 2nd gen CGSE (planned for 4.3.1, Q1 CY2013)
- **CGv6** toolbox of IPv6 transition technologies
 - **Translation** (NAT44, NAT64, XLAT64)
 - **Tunneling** (6rd, DS-Lite, 4-6-4)
- **NPS** for traffic optimization across the network
- **CCN** for tying clouds and Data Center
- **DDoS**: for distributed threat mitigation (planned for 4.2.3, Sept'12)
- **DPI**: for distributed traffic analysis (under investigation)



Data Center Services System

Intelligence Spanning Networks & DC/Clouds

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Network Positioning System (NPS)



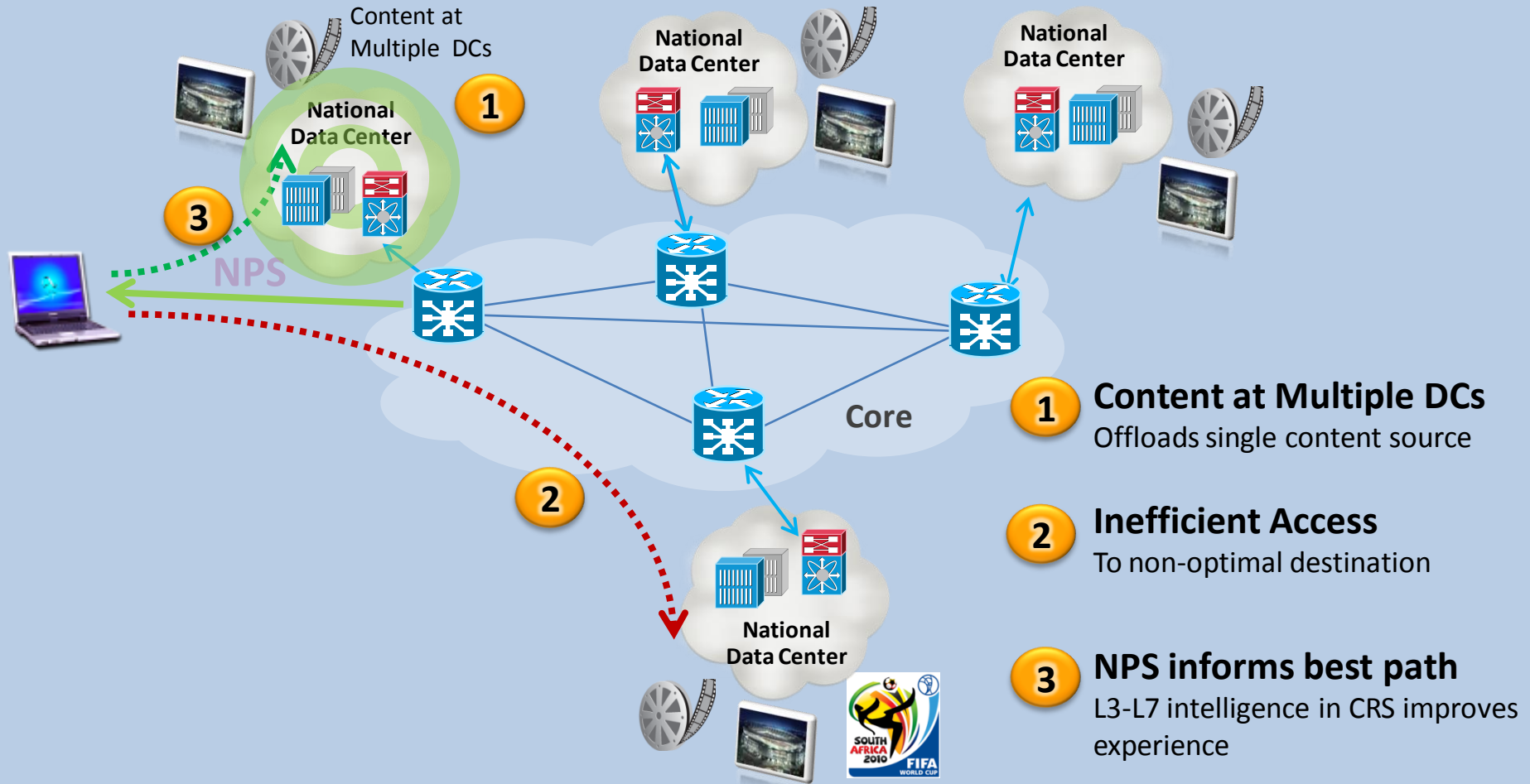
Cloud VPNs for IaaS

Tight Linkages Between DC/Cloud and Core

CRS Carrier-Grade Services Engine



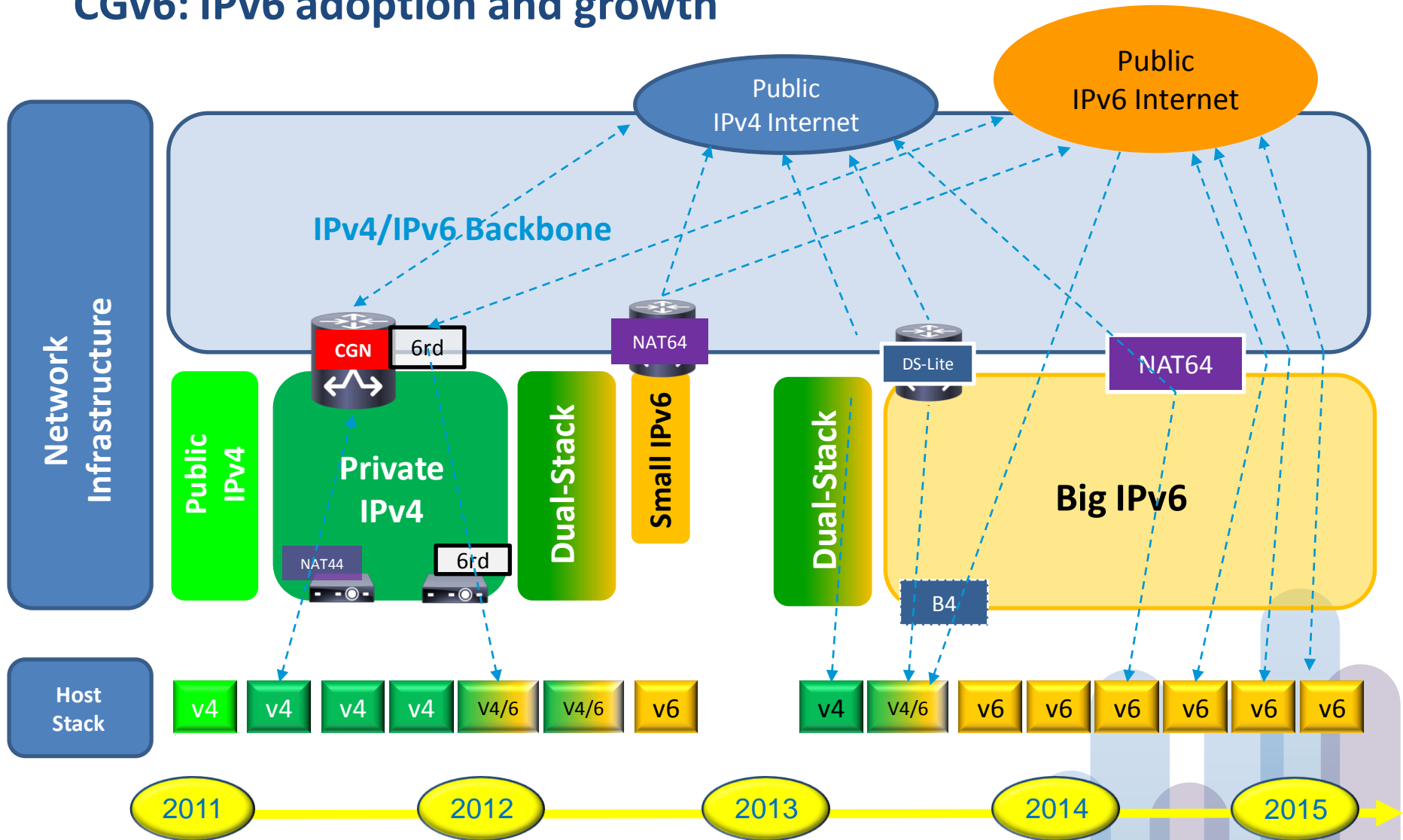
IaaS: Data Center services system



Improves Experiences, Reduces Costs

CRS Carrier-Grade Services Engine

CGv6: IPv6 adoption and growth



Cisco Videoscape

INNOVATE

A unique and innovative medianet platform

Immersive Experience

Across devices, networks and content



High Value Experience

Revenue-generating services




CISCO
Videoscape

High Quality Experience

Cloud + Network + Client



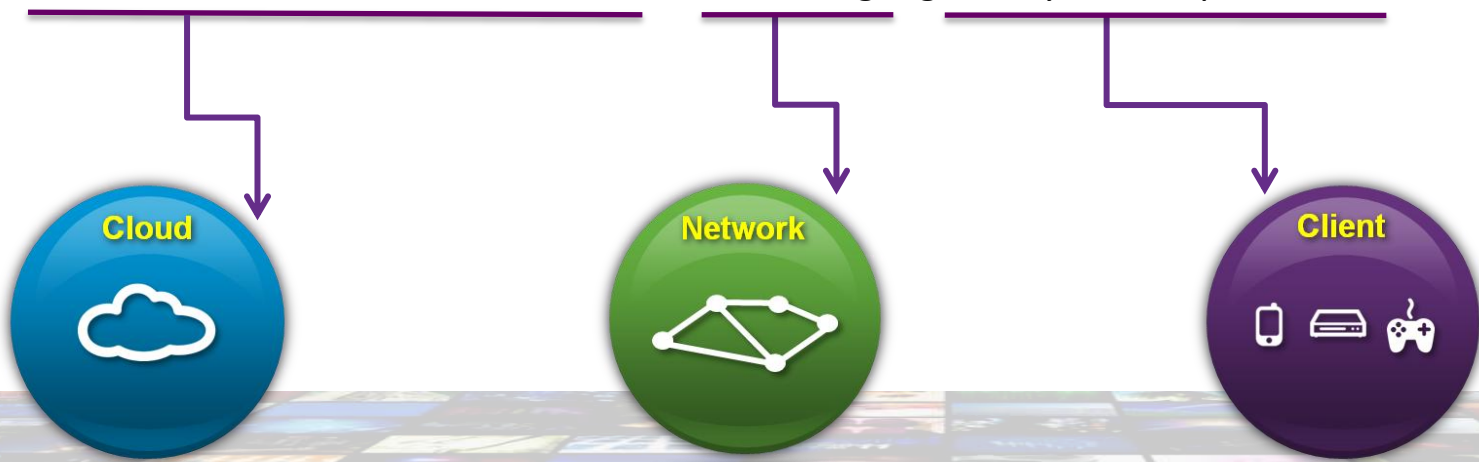
One Architecture for All Services



Carrier-grade Videoscape infrastructure leverages your existing network

Videoscape components

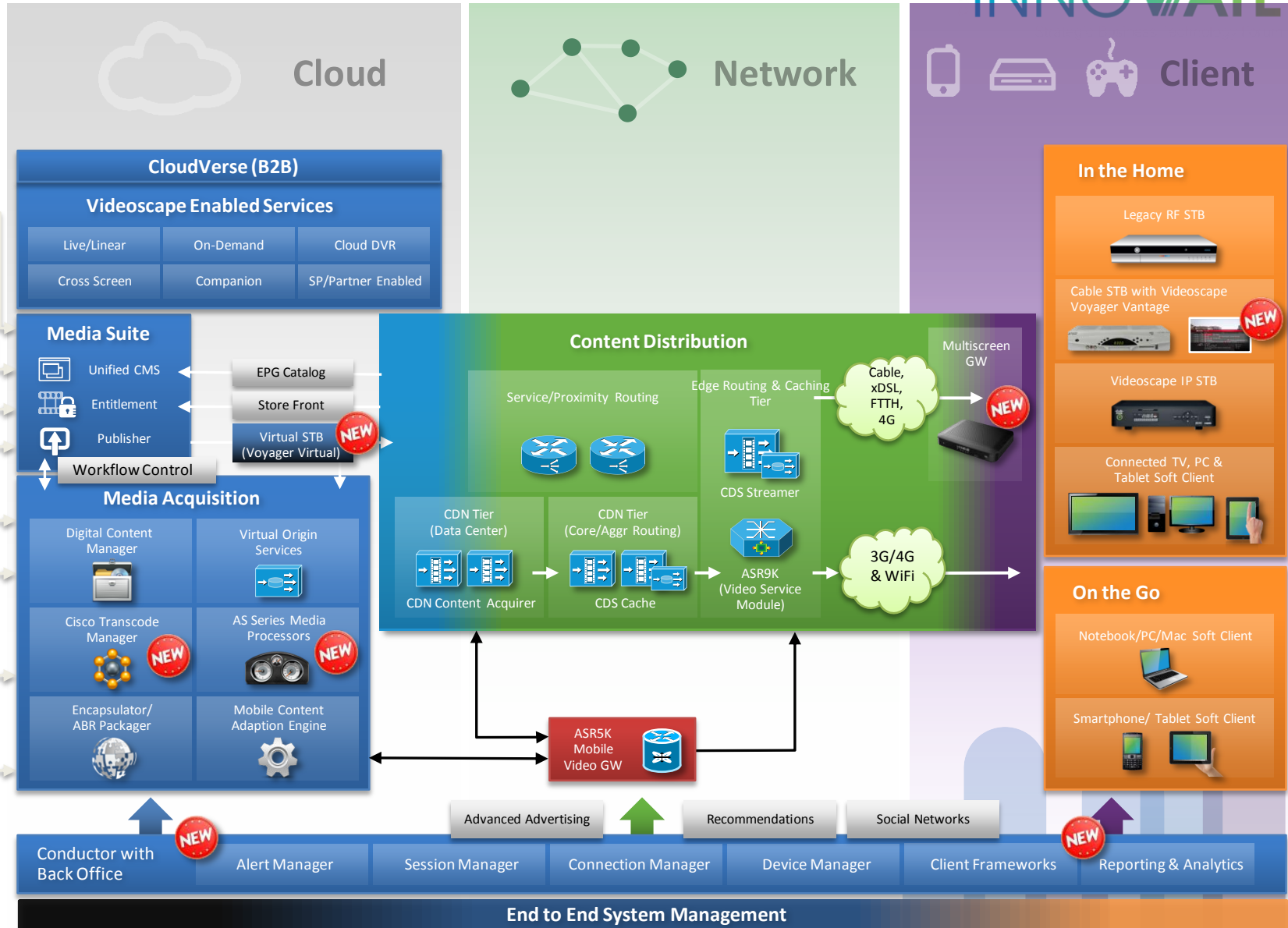
Media Suite software, data center, core & edge, gateways, set-top-boxes



End-to-end video management

VIDEOSCAPE ARCHITECTURE

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Collaboration Service Portfolio



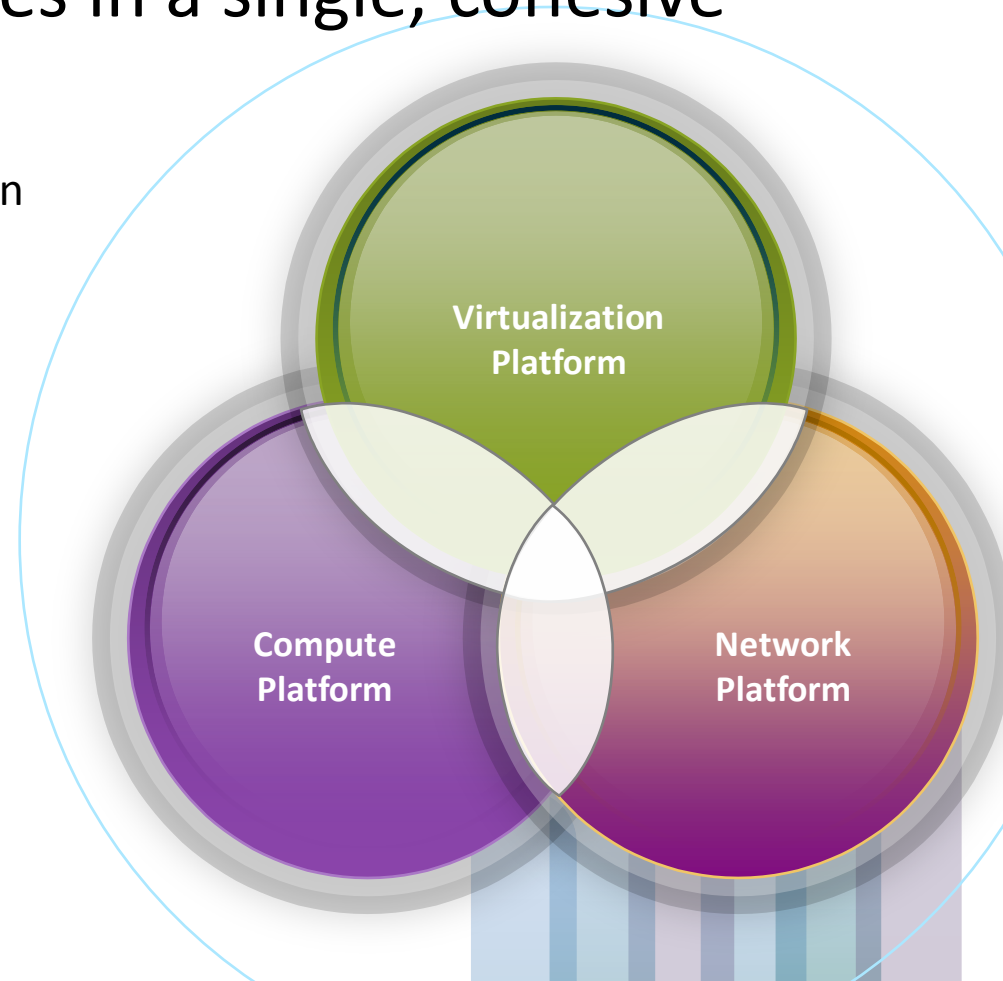
Cisco Unified Computing System



The foundation for the next-generation data center

Pre-integrated compute, network, and virtualization technologies in a single, cohesive solution:

- Combines innovative technology with an open architecture
- Radically reduces number of devices that must be purchased, configured, powered, cooled, managed
- Reduces total cost of ownership (TCO)
 - Reduces CapEx up to 20%
 - Reduces OpEx up to 30%
- Improves enterprise application availability and performance



Summary

- Data deluge is coming in APAC
- Profitability will be driven by, SPs moving to services
- Exploit service monetization opportunity in Video, Cloud and Mobility
- Cisco solutions – NGN, Mobility, Cloud, and Video – are monetization enablers



Thank you.

