P2P to Service Routing

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Landscape Today

- Media-rich applications and services become pervasive
  Unique & evolving bindings between media/apps/subs/devices

- Content Providers and Integrators are looking to:
  Concentrate core business, content production, aggregation and syndication
  Monetize content and evolve business models

- P2P networks enable mass distribution of content to the end user with widely varying controls and monetization

- SPs are searching for methods to satisfy both the consumer and their value chain while meeting the Content Provider needs
Access SP P2P Observation

**Issues**
- Illegal Content perception
- Threatens traditional delivery
- Upstream Link Saturation
- Transit Cost Increase
- Limited participation in value add

**Containment**
- Traffic Management
- Peering Concepts with current eqip
- Build out Network / Upgrades
- P2P Caching
- Compete w / OTT Players

**Collaborate**
- From co-marketing to Integration of Services
- Optimised Delivery: CDN, QoS, Multicast, Quota exemption
- Improved Access to TV & Mobile / STB / GW
- Web Services network interface
- Precision Advertising

**DEPLOY**
- Media Aware Network – H-P2P
- Create Own TTM App value Chain
- Peering at Service Level
- Offer open optimized access to peers, i.e,
  - Storage Savings, higher quality
  - Lower cost of delivery
Service Routing & Service Node
Advantages and Benefits

- New paradigm replaces technology stretch
  Service Routing leverages infrastructure-based P2

- Enables key new relationships and business models
  Form strategic partnerships to learn, deploy, accelerate & evolve
  Renewed focus on core competencies

- Substantial CapEx and OpEx efficiencies

- Capture new revenue streams and migrate on value chain

- Faster time-to-market with powerful development model and flexible infrastructure

- Seamless bridge to future media/apps/services evolution
New Media Optimized Routing Paradigm and Thin Layer Implementation

Today’s Structure:

IP Infrastructure

The Application Layer

New Structure:

Service Routing:
Cache, Put/Get, Event, Workflows/WS/Web2.0, Client

Provider App

IPTV

Middleware:

Thick

Provider Applications Over-the-Top Apps

Cool Tools

YouTube

Middleware

Cache

P2P Overlay

Cool Tools

Joost

Middleware

Cache

P2P Overlay

Content Provider

Brightcove

Akamai

Akamai P2P
New Media Optimized Routing Paradigm and Thin Layer Implementation

The Application Layer

Service Routing:
Cache, Put/Get, Event, Workflows/WS/Web2.0, Client

IP Infrastructure
Service Routing: Key Elements
Service Node, Service Gateway and Foreign Resources

- Client side capabilities
  - HAG, set top, etc.

- Proximity and Network binding
  - Interface to other networks
  - Service interface to SDP
  - Scalability assistance
  - Aggregation & rollup

programmable by SPs, OTPs, CAs and CP’s <-> integrate unique IP
Service Routing Protocol – Leveraging DHT Technology

- SRP Applications
  - Host Function
    - Put/Get
    - Event
    - Replica Mgmt
    - Reliable Delivery
    - Multicast
  - Routing Function
    - Node Join
    - Leaf Set Maint.
    - Routing Table Maint.
  - Forwarding Function
    - SRP Forwarder
  - sync
  - ping

- Groups
- Leaf Set Routing Table
- IP
- TCP
- UDP
- Descriptor Database
Scaling Services, Not Servers
Distribute, Integrate and scale with Overarching P2P Paradigm

Service Routing:
Programmable, Self-Organizing, Self-Optimizing, Self-Tuning, Self-Healing p2p Infrastructure
Potential Provider Models - Capstone

- **Access Network**
  - Broadcast Video Delivery
  - Self-Peer
  - Consumer Data
  - Dynamic, personalized content based on User subscription; 3rd party services supported and Peer ad-supported content
  - MyChannel, RIYL, Metadata Driven

- **ISP Backbone**
  - SuperPeer DHT
    - Peer Tier 1 (BT?), potential InterAS/IDQ peer for horizontal content peering
  - CyberCenter (IDC) for hosting CP/CA, SAN for long tail

- **Metro**
  - Insertion of Content into VoD subsystem; Dynamic, linear/live Ad Insertion
  - Tier 2 SPs accessing content from/through

- **Access Provider**
  - SP/CA putting content into InfraDHT

- **Home**
  - MOCA + L-Band MOCA + L-Band
  - PC
  - Multi-Media Service Gateway
  - Multi-Media Client Gateway
  - DSL Media & Comm Gateway
  - Multicast, Broadcast, Video
  - Unicast, Content, 3rd party supported services

- **User-Produced, ‘Connected Life’ Content**

- **Dynamic, personalized content based on User subscription; 3rd party services supported and Peer ad-supported content**
  - MyChannel, RIYL, Metadata Driven

- **Monetized 3rd party services**
  - DirectTV VoD, Joost, etc
Service Networking - Recap

- Migration from monolithic apps
- Web 2.0 acceleration platform
- CDN is one application of Service Routing

[Diagram showing service networking concepts]

Client/Customer

Deploy Mix & Match Mash-up Reuse

Cache Replicate Migrate

App/Widget/Service Provider 1

App/Widget/Service Provider 2

App/Widget/Service Provider 3

App/Widget/Service Provider 4

Service Routing

CP/CA 1

CP/CA 2

CP/CA 3

Widgets, Apps, Services

Existing in-network & external web services

Content (replicated, cached, etc.)
Potential Topics **Collaboration**

- Network Search
- Network Security: DDoS and Self certification
- Lights out network management
- Presence and location layered on DHT
- Name/address/hierarchy
- Next generation media/apps/services
- Alternative business models and analysis

New Models of Collaboration between industry, government and academia - the possibilities are limitless
Data Collection and Recommendations

*drive intelligent cacheing of non-linear branches*

### Key Concepts
- **Streaming content**: Access Network
- **Notifications via RSS, client**
- **Aggregated usage records**: Local SN Cluster
- **User record/usage profile**: Local SN Cluster
- **Customized recommendations**: Remote SN Cluster

### Media Types
- **Linear media**
- **Non-Linear media**

### User Actions
- **Fast forward**
- **Repeat play/season pass**
- **Skipped**

### Data Processing
- **Data Mining**
- **User usage record**
- **Implicit ratings**