International Multimedia Telecommunications Consortium

Next Generation Content Delivery

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Agenda

- Trends/Insights on Content Delivery
- Industry Challenges
- IMTC's Call to Action

Trends/Insights on Content Delivery

Trends/Insights

- 3 Screens Today
- Competition from New Entrants
- FMC deployments to leverage IMS/MMD for Digital Entertainment
- Carriers embrace off deck content
- Walled Gardens open to 3rd Party Svcs
- Rising Consumer Expectations
- DRM's Role Evolves From Restriction to Business Process Enablement.

3-Screens Today

- Partially fulfills the service vision to get to market, but with few efficiencies realized
  - Proprietary
    - Content selection limited to inside “the garden” (off-deck delivery perf suffers)
  - “Cobble & Convert” Strategy to platform unification
    - Most content lives on-deck, replicated in multiple formats
      - E.g. one episode of a show = 4 to 10+ files to be stored
        - PC -> WM hi, Flash, Real, H.264
        - STB -> MPEG2 or 4 x SD and HD
        - Mobile -> 3GPP/2, Real, WM low.
    - Limited Provisioning capabilities
      - Billing CDRs and other transactional redundancies continue, batch reconciled in non-real-time.
  - Mobile and Internet media are usually best effort w/o QoS/QoE guarantees. (Even inside the garden.)
  - Multinational deployments either a) lack notion of regional/local content or b) replicate infrastructure to provide an entire FMC instance per nation

New Entrants Go Around, Over-the-Top, or become Partner CPs/VNOs

- Around
  - Fixed/Mobile WiMax providers starting relatively legacy-free. Likely to move quickly to IMS, pulling in industry timeline.
  - 700mhz auction for D2C Web 2.0 svcs?
- Over-the-Top
  - Low-end Disruption from best-effort service providers that are “good-enough” and will continue to get better. (e.g. Joost, Sling, Bit Torrent, etc.)
  - Content Provider Portals (e.g. YouTube, UEFA Soccer, ESPN, etc.)
- Partner CPs/VNOs
  - AKA the guys going over the top today who have customer traction
  - Target a lifestyle/demo through private label w/carriers.
    - (e.g. 30 ch. of TV from China offered in San Francisco via companion STB)
    - iPhone+iTunes
  - On Device Portals/Rich Media apps begin to replace MVNO model
    - e.g. ESPN Mobile now a Verizon app

IMS/MMD as Digital Entertainment Platform

- Further out, IMS deployments move beyond telephony to deliver digital entertainment
  - 3GPP Rel 7 IMS defines Fixed to Mobile interconnect.
    - QoS guarantees now possible for content delivery
    - IPTV & PacketCable (PCMM) solutions will also begin to leverage IMS
  - IPTV & PCMM laggards get a chance to catch up?
    - Possible to move straight to IMS for set-top-box delivery
- Caveat: Still lots of issues delivering media over IMS
  - SIP can't [yet] provide "DVD style" playback options (FF,RW, etc) & can't talk to RTSP
  - SIP/RTSP/HTTP blended services interaction
    - Common proxy infrastructure?
    - Common session management?
  - IMS/WiMax QoS interaction

Embracing IMS Means a Fundamental Change to the Carrier's Business Model.

- **IMS forces a shift in the strategic point of control from the actual physical distribution of all content and services on the network, to the BPE of how those services flow**
  - Persistent IP connectivity between fixed & mobile devices *changes everything,* having a services strategy in place from day 1 is *essential* to success
    - Knowing your desired place in the Content Delivery Ecosystem is key
  - Going half-way hoping to just enable telephony efficiencies is a recipe for disaster.
    - Competition & possibly regulation will likely allow 3rd party services to flow across the IP network.

Carriers Embrace Off Deck Content

- Content proliferating too fast to trans-code/crypt, catalogue, rate and store everything on deck.
- Embracing off-deck relationships means a “bottomless” content offering to serve the long tail requests.
  - Limited only by content discoverability
- Still must flow “through the deck” for LCR and BPE
  - Least Cost Routing= Networks (and CPs!) benefit from keeping high request content cached on edge or p2p, but tail best served from core.
  - Business Process Enablement= Promotions, advertising, gifting, recommendations, etc. can be determined dynamically at moment of request or access.
- No loss of control
  - Can still restrict user access to parts of the catalog by age/geo/DMA etc.
  - Offloads storage, transcoding & packaging, but allows rights and transactions to stay on-deck.

Walled Gardens Open to 3rd Party Svcs

- Carriers will allow 3rd party service providers metered access to enhanced network services and users.
  - Pressure from Tivo/Amazon style offerings on STB, iPhone/gPhone on mobile and potential regulation pull in the timeline
  - Category leaders already showing up (Google, YouTube, Facebook, MySpace)
  - Contract-based agreements can't keep up w/demand.
    - 3rd parties reg their svcs for discovery, AAA, & rev split.
- 3rd parties will still want/need to work *with* carriers
  - 3rd parties must focus on innovation, don't want to replicate core services like session mgmt, identity, presence, billing, etc. (why MVNO's fail)
  - Carriers control the user's plan and equipment (and hence service discovery) on mobile and STBs.
    - Very few companies have portal sway and/or could mount the D2C marketing campaign needed to overcome this.
  - "Conservation of resources" applies. Users will choose least effort path to svcs they need, service providers choose least effort path to users
- Service Oriented Architecture is key enabler.
  - 3rd parties need to find each other and carrier's services to dynamically provision svc bundles.

Rising User Expectations

User expectations are based on familiar TV offerings:

- 100's of channels,
- Unified Program Guide
- Pay Per View
- Premium Channel packages
- PVR (Scheduled Recording /Time-shifted Viewing)
- Recommendations

…coupled with the spontaneous, convenient and personal experience of mobile and web

- Interactive Vote & Chat
- Micro-payment, pay as you go and ad-subsidized
- Personalized content & filtered views
- Content sharing between PC/devices/users
- Social Networking & Collaboration
- User generated content
- Fast and highly relevant search results

…and are on the rise with the dawn of converged services & unscripted "mashups"

- All of the above, timeshifted, placeshifted, shapeshifted & blended
- Unified billing
- Rights to *content*, not files!

DRM's Role Evolves From Restriction to Business Process Enablement.

- DRM controls the moment of access which is your best (only?) chance to reach the media consumer with new offers.
- Rights will live in the network and be dynamically issued/validated during moment of access based on
  - Current promotions (buy 1 get 1 free, upsell PC access)
  - Plan changes (paid subscription vs ad subsidized)
  - Content acquisition costs
  - Customer acquisition value to advertisers, etc.
    - Ads rotate based on highest bidder
- Converging Media Requires Comprehensive Rights Management
  - Anticipate Demands of Media/Community as a managed converged service
    - Enable subscription access to media
    - Digital content lockers hold media rights and pointers to the source.
    - UGC upload and access
  - Embrace the user's fair use rights, then upsell
    - Provide/enforce the user's fair use rights to media they own
    - Upsell trans to multiple devices, formats, 3 screens, concurrent access, etc.
  - Ad-subsidized offerings defray costs, enable creative models and most importantly, *monetize* media delivery!

Industry Challenges

Challenge: Propose Appealing, Feature-rich, User Attractive Services

Response:

- Allow the market to innovate and differentiate within a consistently deployable/scalable service architecture environment.
  - SP facilitate optimized/personalized service delivery over the variety of access networks and service enablers available to applications.
  - SP simplify the effort required by Content Providers (and on clients, Application Developers) to innovate, operate, and scale new services.
- Leverage standardized service enabler frameworks, to facilitate smooth introduction of new services.

Challenge: Valid Business Models For The New Content Consumption Model

Response:

- Create advertising models that enable customers to purchase and consume digital content at their leisure
- Create attractive enough value proposition to persuade companies to buy those ads.
- Targeted advertising: direct those ads at just the right users.

Challenge: Optimization Of Player Relationships

Response:

- SP provide service/content aggregation for Content Providers and Publishers
- Bundled elements in an overall attractive presentation which benefits the Content Providers and Publishers by creating a critical mass of service/content experience, which keeps users coming back for more.
- i.e. operation of mobile network portals:
  - Draw upon content from a variety of sources and present it in a consistent manner for users.
  - Role extended to on-device-portals (ODP) through advanced content syndication/delivery frameworks such as the OMA Dynamic Content Delivery (DCD) enabler.

Challenge : Meeting Price Points On User Devices

***Response*:**

- Adoption of standardized service enabler frameworks
  - Preserve the ability of vendors to differentiate at the application/presentation layer create a critical mass of service/content experience that drive device sales and increase customer satisfaction.
  - Simplify the effort of vendors to produce devices upon which Application Developers and Content Providers can depend.

Challenge: Increasing Bandwidth Requirements

Response:

- Ability to control the connection profiles configuration
- Control of routing for client interaction with service enablers, e.g. the data connection/bearer parameters (e.g. in 3G networks the APN or Access Point Name), transport protocol, proxy, security, authentication, etc.
  - terminal pre-configuration, embedding settings inside applications
  - through device management (e.g. OMA DM).
- Optimize the network traffic routing and transaction processing
  - using connection profile configuration and protocols to direct transactions via specific service elements (e.g. connection/policy control elements and general proxies) for "control plane" functions (e.g. session management, service layer connection management) and "user plane" functions (delivery of the actual content/service).

Challenge: Increasing Bandwidth Requirements

Response:

- Use multiple bearers and delivery methods.
- Select the most appropriate bearer and delivery method for the service at service delivery time.
- Bearers: various point-to-point IP networks or multicast/broadcast nets
- Delivery: client-initiated (pull) and server-initiated (push).
- Balance the use of bearer networks and delivery methods to optimize network utilization,
- Within the limits imposed by the applicable service constraints (e.g. service latency and content freshness).

Challenge: Usability & Interoperability

Usability Response:

- Media has to be adapted to a format that is most usable for the platform on which it is to be consumed.
- Content delivery and content transformation (e.g. for web, images, video, etc) are roles that the Service Provider can facilitate for Content Providers, to simplify their need to support the wide diversity of devices, delivery contexts, and applications that users have come to depend upon.

Interoperability Response:

- leverage a standardized framework for delivery context discovery (include device capabilities and network capabilities),
- content can be adapted and delivered in forms that are reliably interoperable with application clients.

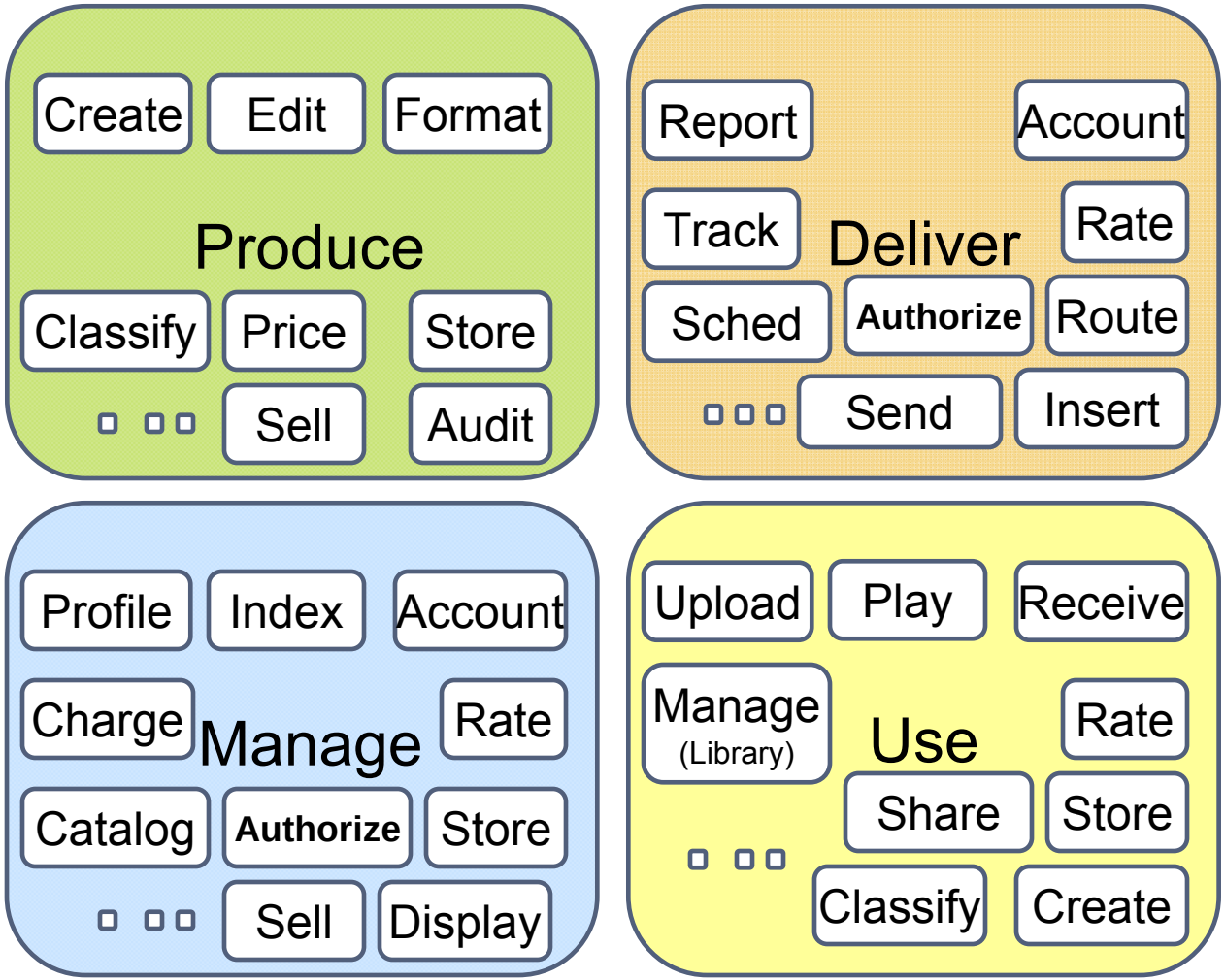
IMTC‘s Call to Action

Content Delivery Systems Today Take Too Long & Cost Too Much To Deploy

- ASPs and Carriers must repeat costly full systems test and use cases for each service deployed with no baseline for reuse.
  - No pre-established interop reqs above the SDO level
  - Intercarrier services? Good luck!
- Testing frameworks provided by various SDO's (if any) target requirements verification only for their *own* standard(s)… …Yet even moderately complex content delivery services have to deal with multiple standards
  - Multibearer
    - All flavors of 2.5/3G/4G GSM & CDMA, WiMax, WiFi, Digital Cable, DSL, Fiber, IPTV, DVB, FLO, etc…
  - Multiprotocol
    - WAP Push, OMA DCD, RSS/Podcast, SMS, MMS, PSS, MBMS, BCMCS
  - File Formats & DRM packaging
    - 3GPP, Real, WM, MPEG2/4, Flash, DVD, Blue-ray, HD, etc…
    - OMA-DRM, Janus, Helix, Adobe, CAS, CoreMedia, etc.
- Standards terminology, actors/use cases inconsistent across SDO's
  - Multiple definitions of "service provider" & "enabler" with inconsistent views of who provides what and how.

The industry needs a *use case based* way of tackling content delivery's complexity…

Media Delivery Value Net™



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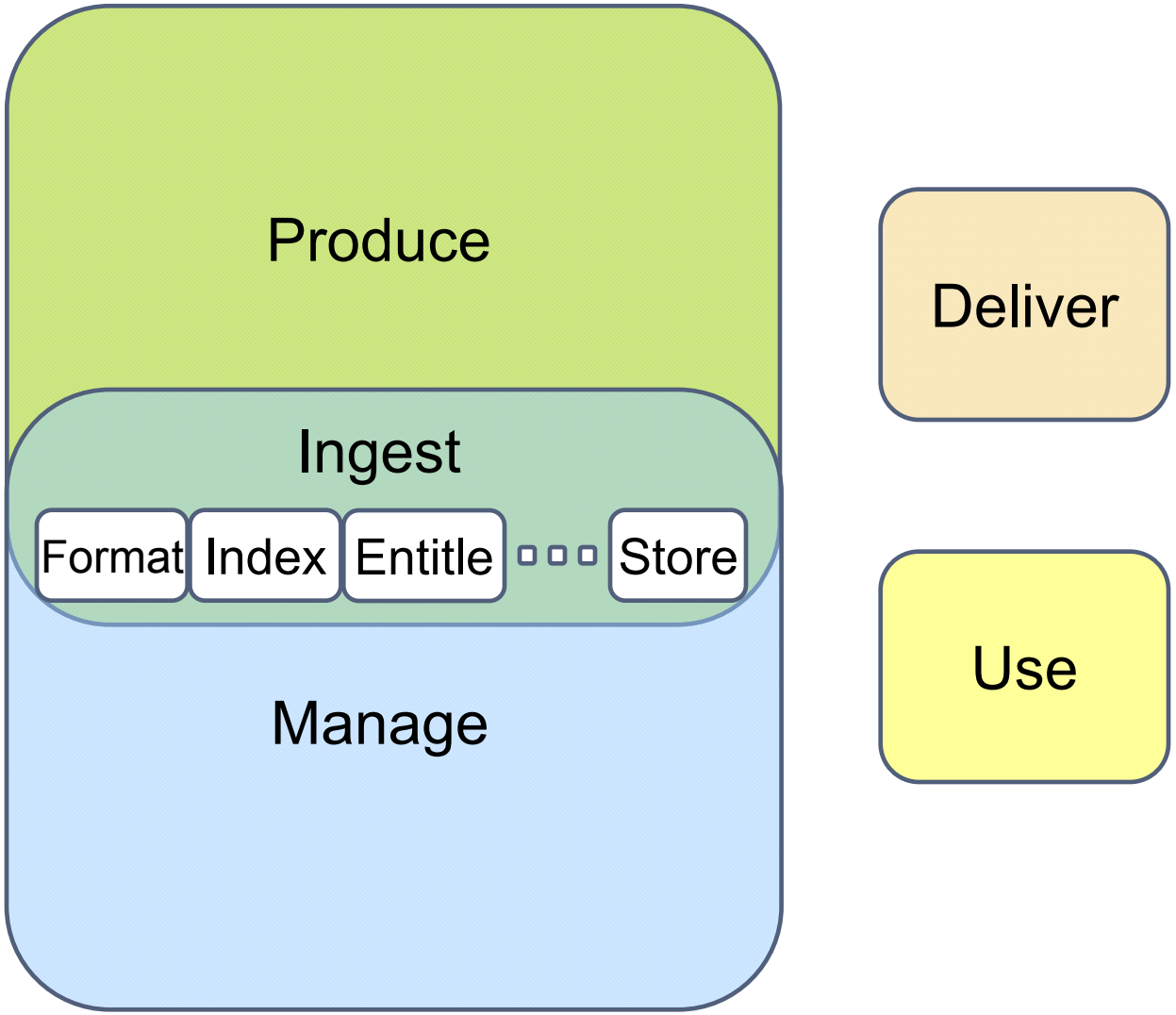

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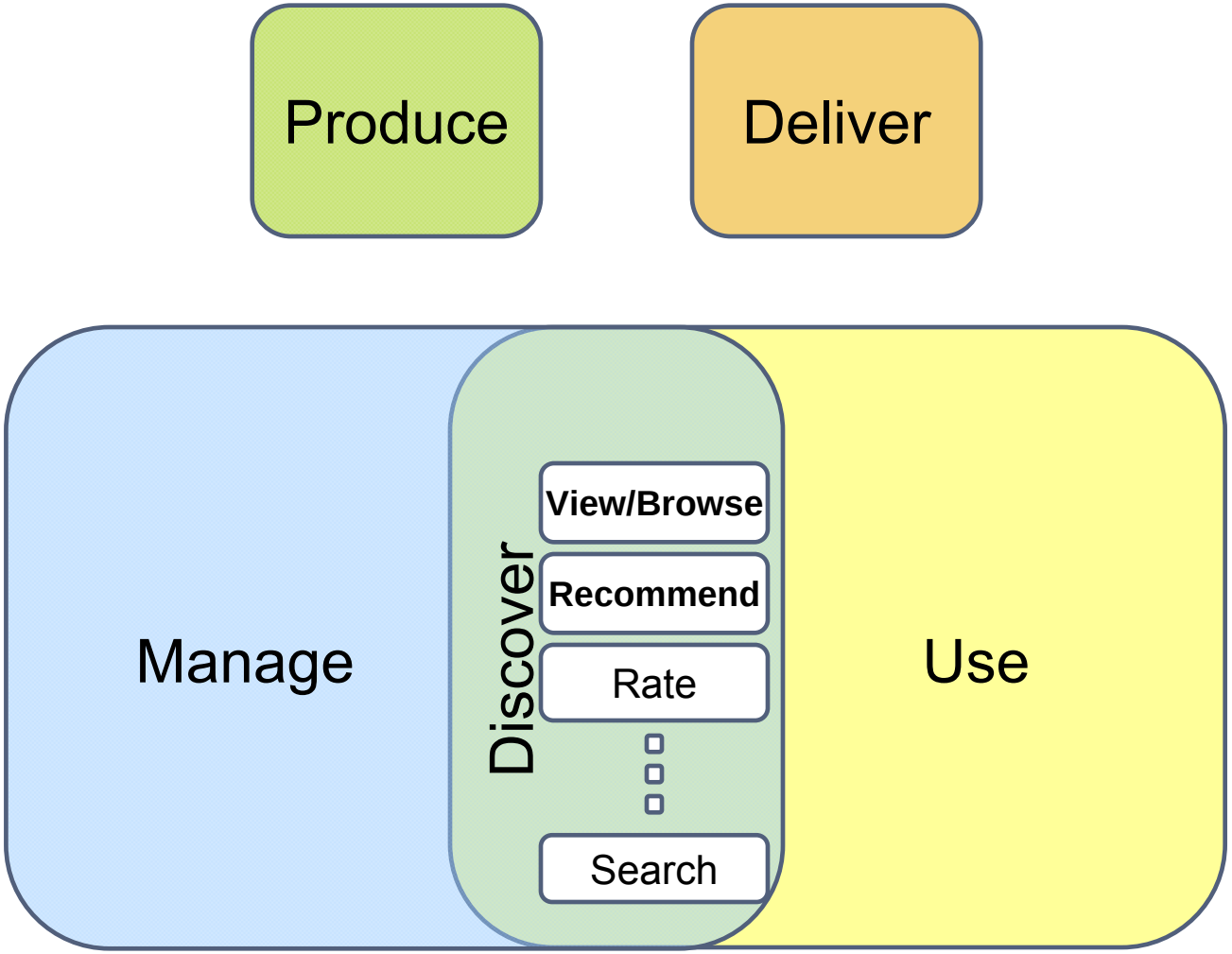

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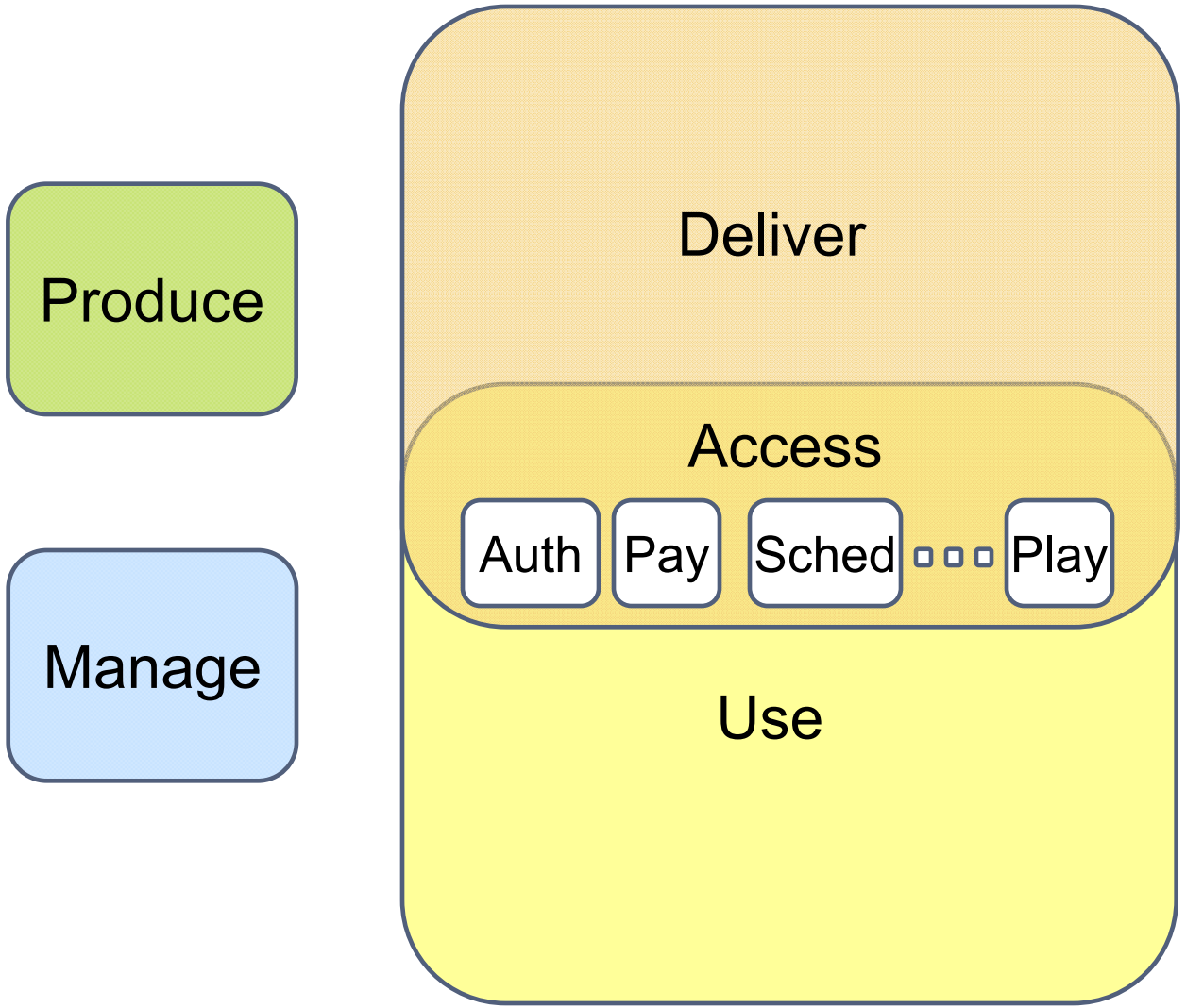

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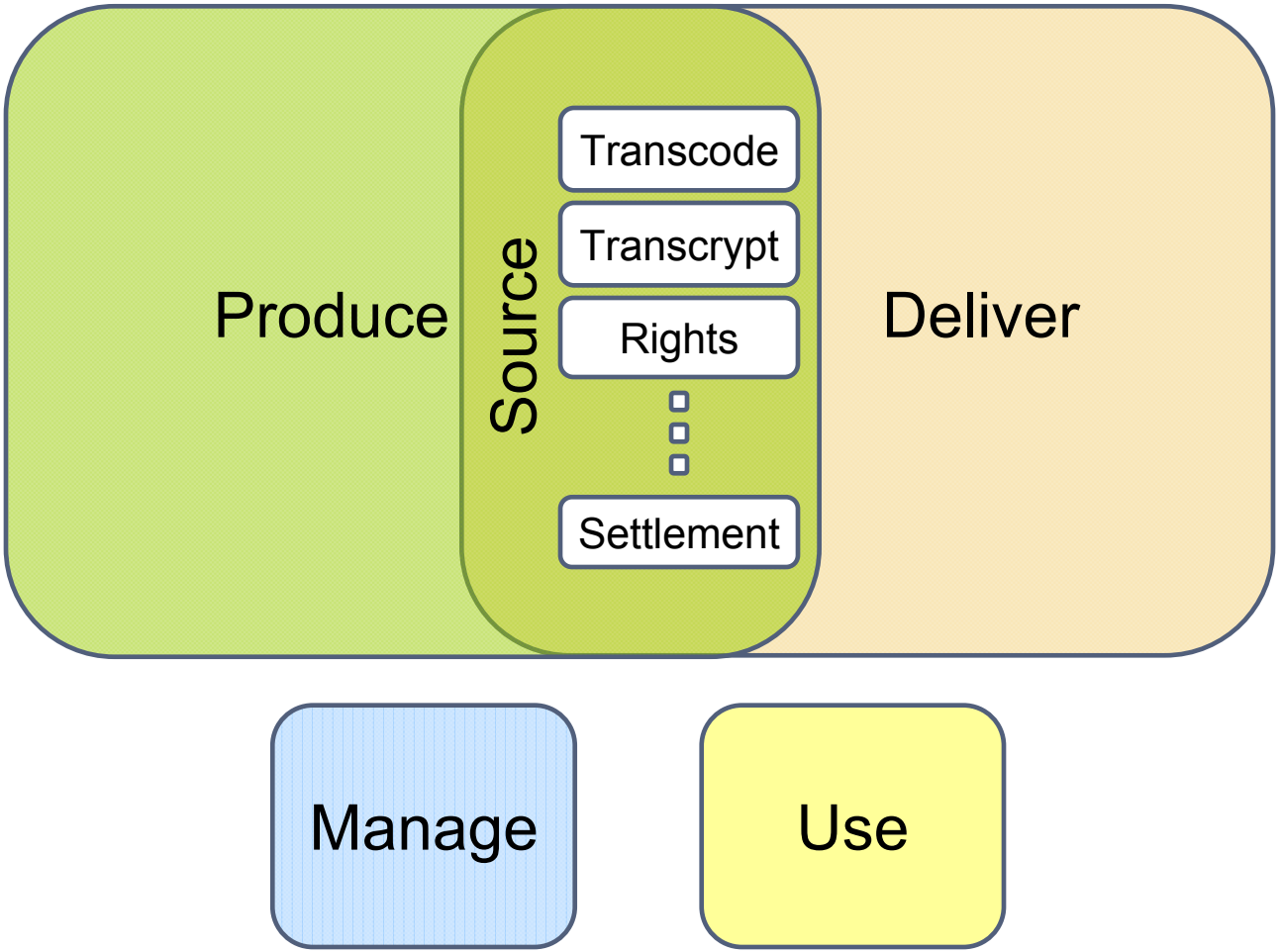

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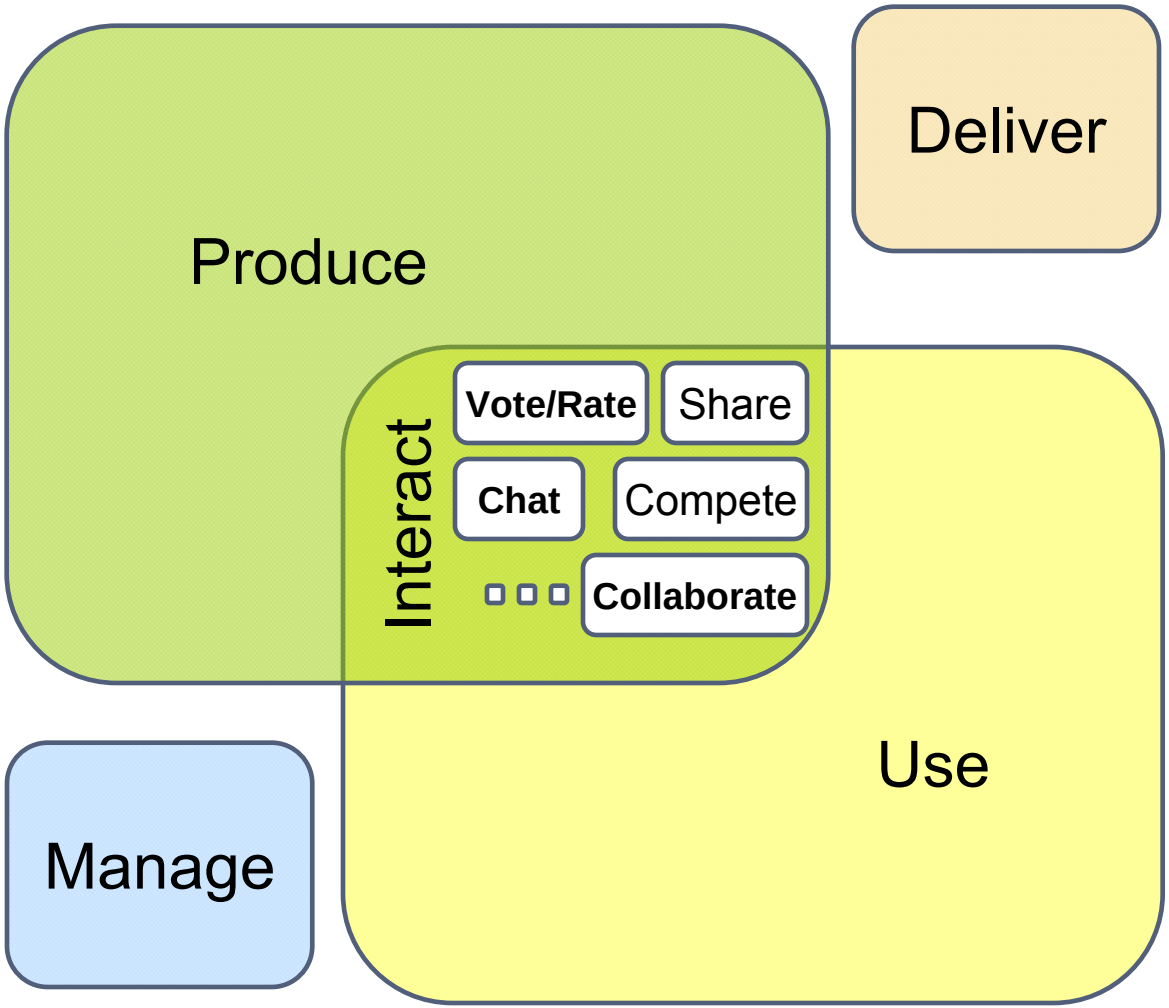

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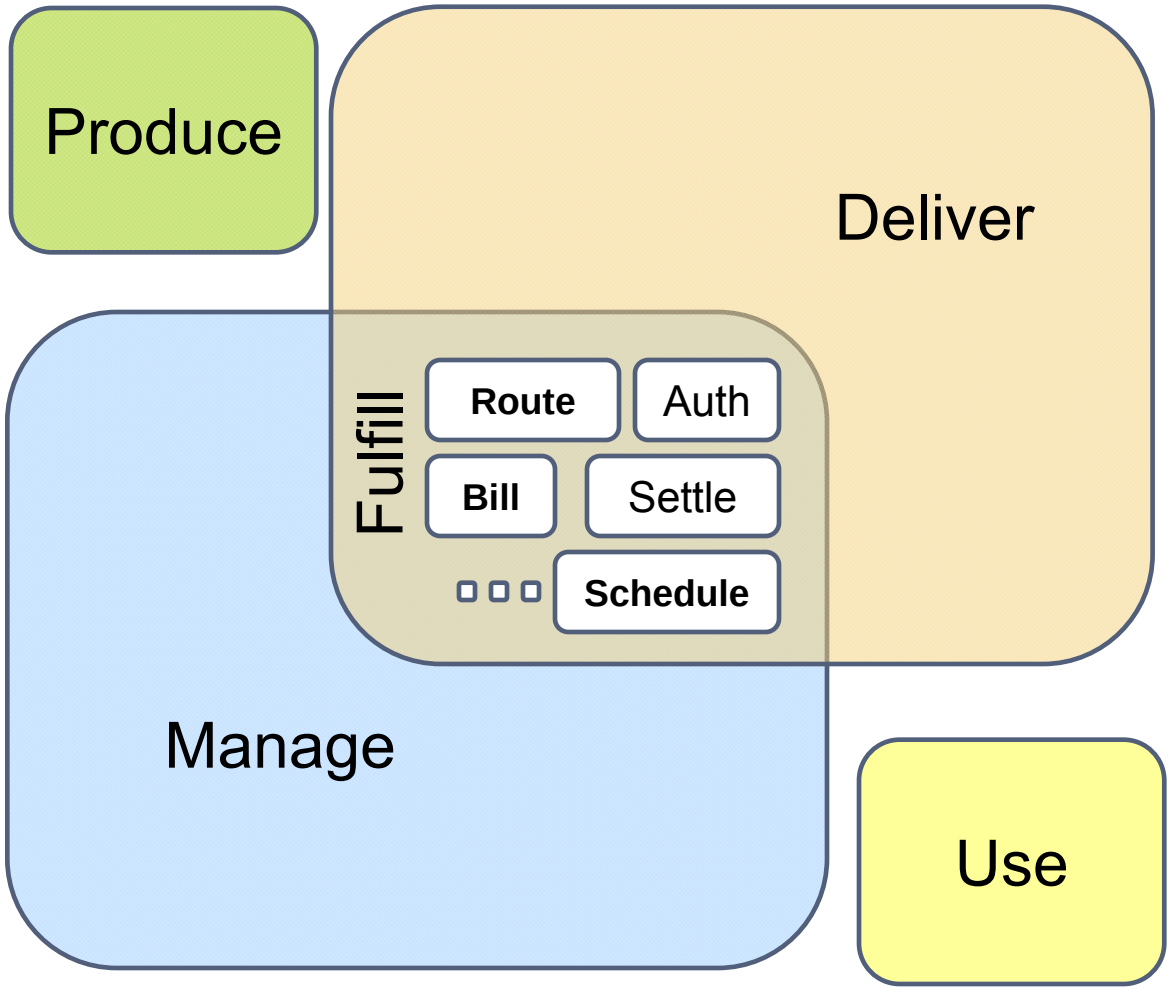

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Challenges/Responses Restated in Terms of the MDVN™

- **Produce**
  - Interactivity
  - Storage (Content moves off deck, has to be sourced from somewhere)
  - Dynamic Sourcing
  - Content Rights must separate from the DRM package
  - Collaborative Classification/Tagging
  - Scalable encoding
- **Manage**
  - Dynamic Cataloging –Content/CPs can be added to catalog on the fly
  - Dynamic Discovery
    - Personalization/Targeting: The offering may not be the same for User A and User B. Or even the same for User A tomorrow
    - Device & User profiling
  - Scalable, Automated Ingest to handle UGC

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Challenges/Responses restated in terms of the MDVN™ (cont.)

- **Use**
  - Collaborative Classification/Tagging
  - UGC copyright/royalities
- **Deliver**
  - **True cross-service provider SOA**
    - Dynamic Transcode/Transcrypt
    - Dynamic Content Sourcing
  - **Media Roaming**
    - The best experience for the user and LCR for carrier depend on where user is and when they need the content.
    - DRM evolution a must
  - **Media Microsettlement**
    - Rev splits for off net delivery.
      - Sometimes the cheapest way to fulfill *won't* be over the network where the request originated
    - Rev-splits with [off-deck] content providers
      - Long one-off contract negotiations based on posthumous CDR accounting give way to tweak-able dynamic settlement

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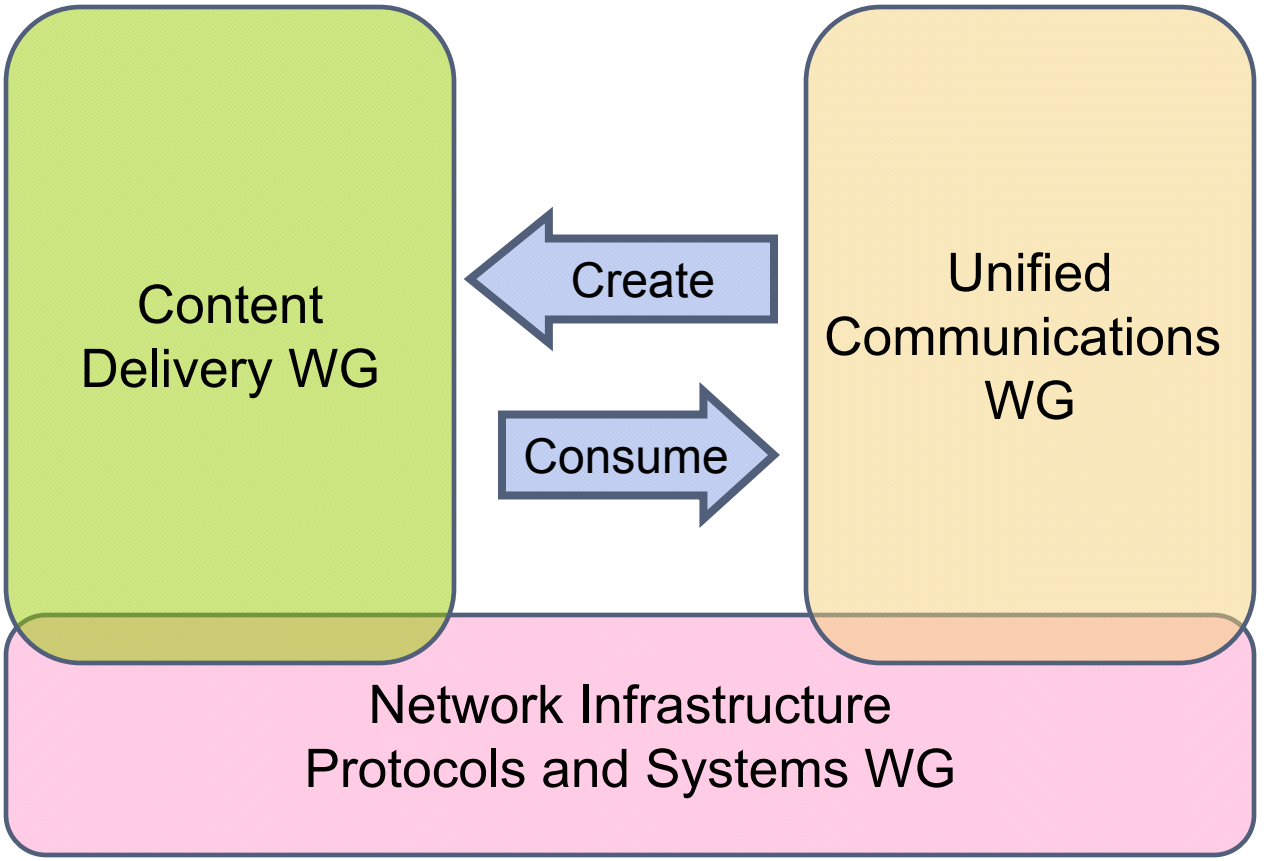
IMTC's Revised Mission Statement

- To improve customer experience and accelerate market adoption of **content delivery** and **unified communications** solutions through interoperability of products and services based on open standards.

Content Delivery and Unified Comms



Content Delivery AG

- Prior content interop focus was only SDO svc level
  - (e.g. 3GPP Packet Switched Streaming)
- New focus on end-to-end content delivery svc usage scenarios
  - e.g. Subscription Clips
    1. New subscription content is published (in one file format)
    2. Content is cataloged and delivered to subs with various handsets/PCs/STBs on various networks (Internet, DVB-H, UMTS, WiMax, Cable, IPTV, PCMM, etc.)
       a. 2.5G Subs receive a podcast on next tether to PC.
       b. 3G Subs receive WAP Push or OMA-DCD or Hyperlink in SMS, etc.
       c. FLO/DVB-H subs receive a scheduled clipcast
       d. WiMax subs have it FLUTE'd out on scheduled multicast
    - Test Points
      - √ Did the content get to the UE when it was scheduled/requested by client?
      - √ Was it formatted correctly for the UE (Transcoded, transcrypted, scaled, etc?
      - √ Was the proper pricing offer presented on access?
      - √ Did everyone get paid?
      - √ Repeat checklist for inserted ads and other content in presentation.

Content Delivery WG Status

- Drafting charter and arch based on End-to-End svc scenarios and use cases
- New AGs being proposed
  - Vary from MDVN Use Cases to SDO Protocol to End-to-End Scenarios
- Establishing new liaisons
  - Intend to leverage existing standards/SDOs and interop activities where possible/practical (e.g. OMA BCAST/ plugfests, 3GPP-IMS, MMA, etc.)

Now is the time to get involved to have the <u>most impact</u> and to make sure <u>your</u> problems are getting solved!

Thanks!

Please bring your questions to the BoF and Cocktail hour!

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