

IT Thinking For Professional Media

Brad Gilmer – Gilmer & Associates, Inc.

Grant Hammond – Grant Hammond
Consulting, Ltd.

Real Problem Statements

“I want to be able to swipe a credit card and turn up a service. When I am done, I want to pay for what I have used. No CapEx.”

Richard Friedel - FOX

Real Problem Statements

“For EuroSport’s next set of facilities, we want a cloud approach for physical kit, we want common access to all content, and we want distributed operations that delivers remote production for all.”

“We are building a private cloud for live production.”

Gordon Castle - EuroSport

Real Problem Statements

“I don’t want to be “Dr. No”, always telling people why they can’t do something. I want a dynamic infrastructure that allows the business to try out new things without breaking the bank.”

Brad Gilmer – Formerly Turner Broadcasting

Real Problem Statements

“We are investing in a massive IT-based facility. We hope that over time, the industry adopts more IT-thinking to allow us to innovate based on the infrastructure we are building now.”

Francois Valliant – CBC / Radio Canada

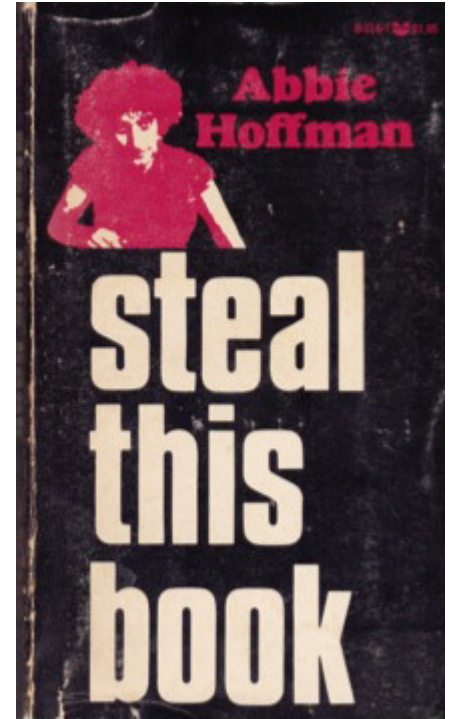
What is the problem?

- IP transition long on promises, short on value to end users
 - IP not delivering the ‘ilities’ (agility, flexibility, composability, reusability...)
 - Not less expensive
 - Not “bill-per-use”
 - Not easier to implement
 - Not easier for IT people to understand (ST 2110 essence, PTP, no HTTPs, no DNS/DHCP, no load balancing, etc...)
 - Not leveraging Internet technology
- How can users achieve the vision of flexible, composable facilities?

What's The Solution?

IT thinking for professional media

- Steal everything!! (From the IT domain)
- Automate EVERYTHING!!!
- Start with security!!!!



IT Thinking For Professional Media

Sounds simple

- IT and Computer Science are focused on delivering 'ilities' at scale
- Microservices are 'next big thing'
- Huge pool of smart people

But how?

IT Thinking

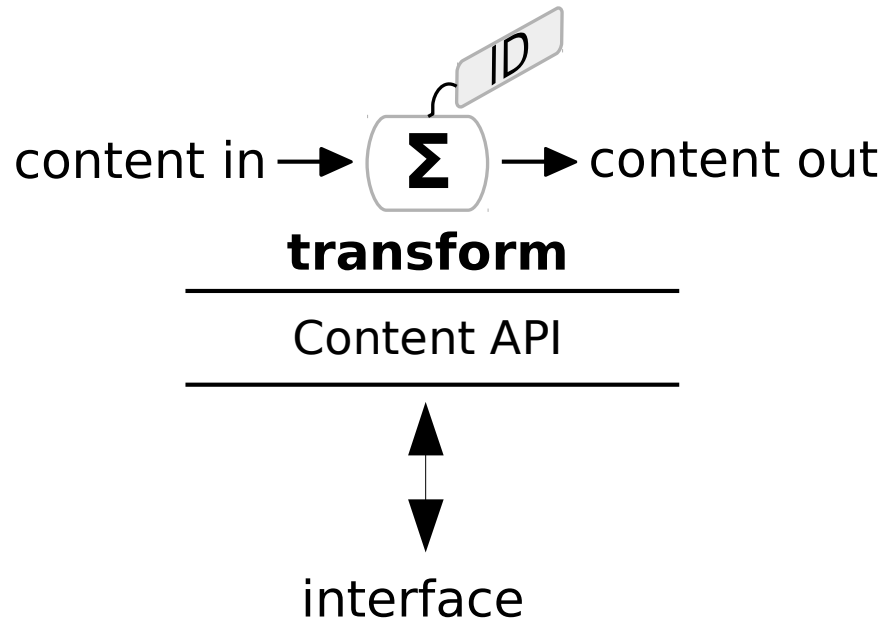
(Steal Everything – Great! But anything specific??!!)

Umm... yes. I brought a list...

- Immutable Identity
- Names (URNs)
- DNS/DHCP
- Idempotency
- Stateless machines
- Eventual Consistency
- Microservices
- Cloud thinking (for physical kit)
- Modeling of transformations
- Self-documenting APIs
- Everything expressed as a Capability
- Timestamps and buffers (sync at presentation)

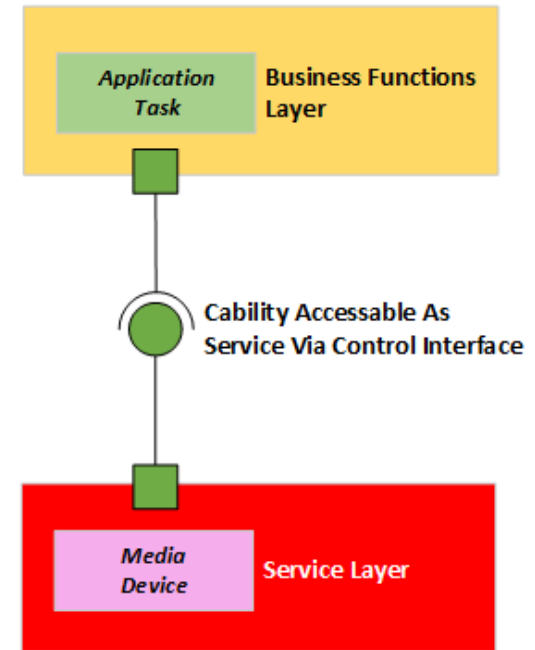
Composable Media Service

- Ubiquitous Media Service Model
 - Content in
 - Content out
 - Perform a transform
 - Has a Control Interface
 - Assigned an immutable ID
 - Has a self-describing interface
 - Is Atomic – does not do too much
 - This Media Service provides a Capability (e.g. video fade)
- (Call it a micro-service if you like...)



Simplified Service Exposure & Consumption

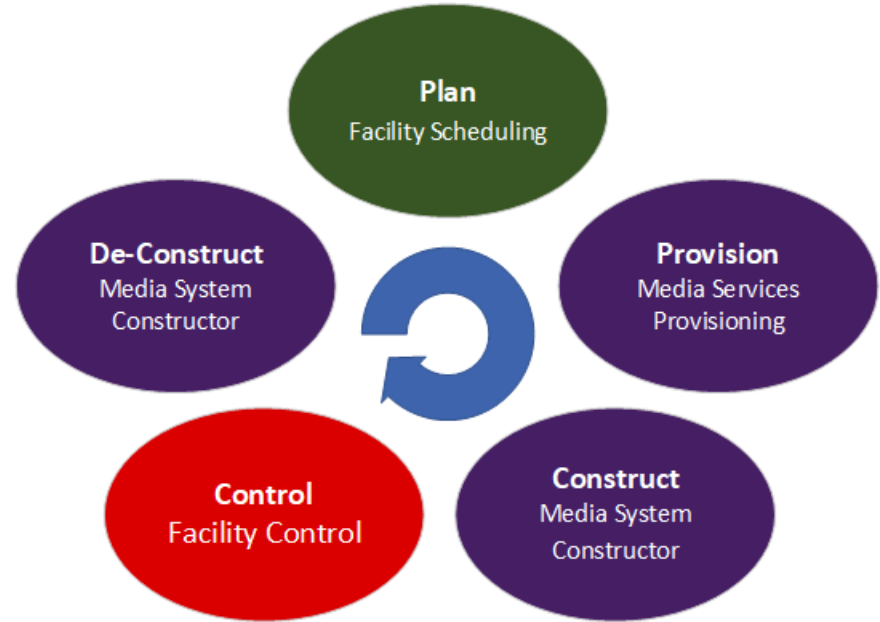
- Media device in the service layer
- Offers a *Capability* as a *Service*
- Application Task at Business Function Layer consumes the *Capability*
- When finished, *Capability* is released back into the Service Layer



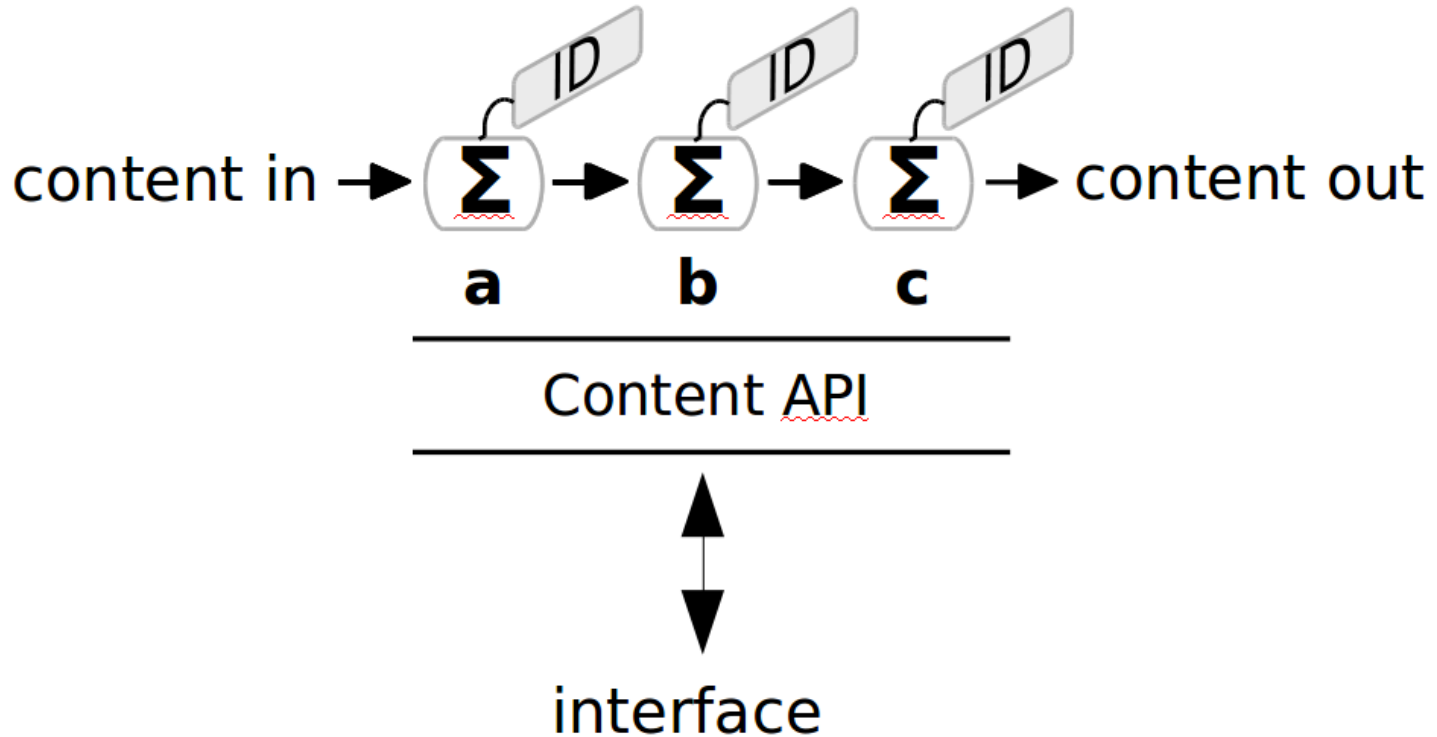
USING MICROSERVICES

Media Business Process Cycle

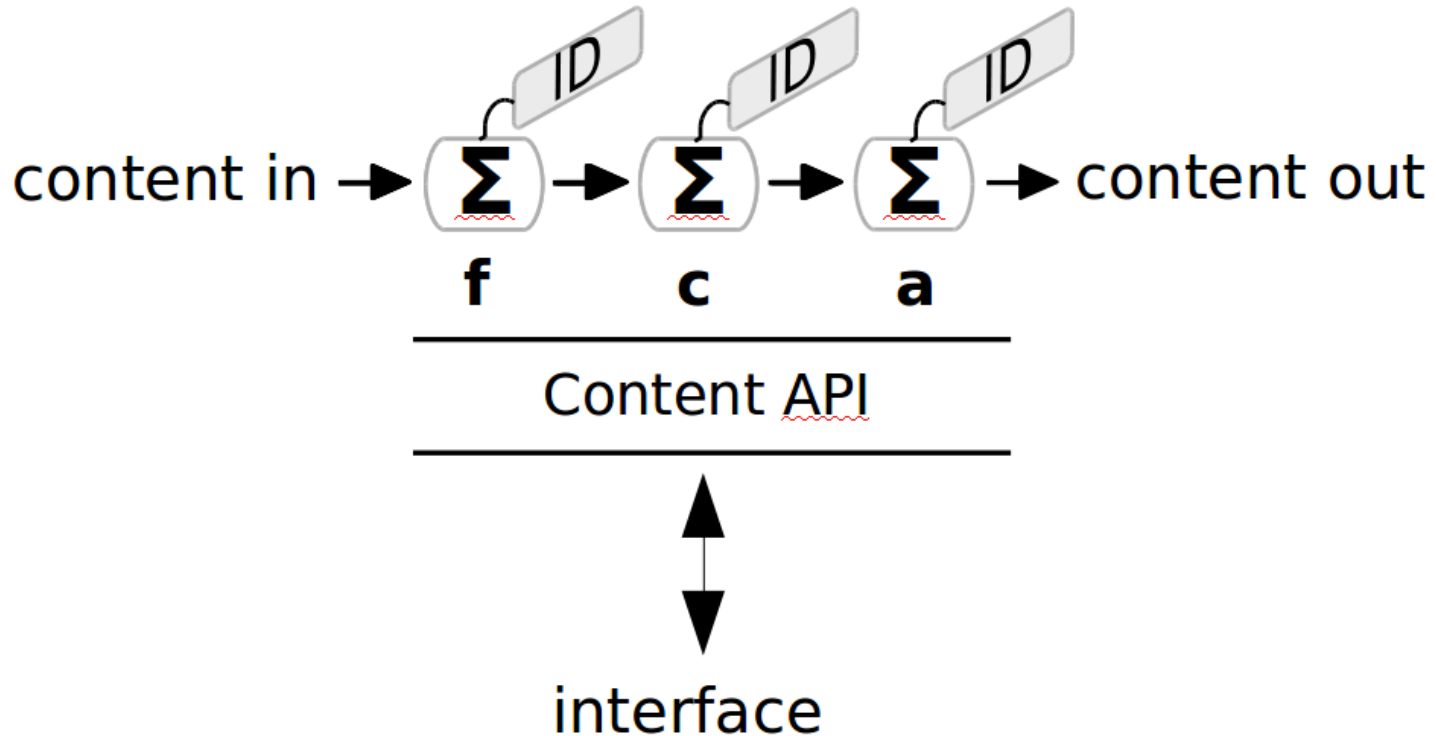
- Plan
- Provision
- Construct
- Control
- De-construct



Composable Media Services



Composable Media Services



IT Thinking For Professional Media

Wonderful!

But can we please get specific?

- Can we develop an architecture that does this?
- How do we know the resources we need will be available in the future?
- Can we build facilities ‘just-in-time’? If yes, how?
- Can this work in on-prem, off-prem, cloud, multi-tenant?

More Questions

- How can we expose capabilities?
- How do I interact with the Media Device?
- How do I know the capability will be there when I need it?

Offering & Consumption of Services

- Exposing *Capabilities*
 - *Media Device* has a *Capability*
 - That is a *Resource* that is *Registered*
 - *Registry* may be queried to find a *Capability*
- Interacting with the Media Device
 - Media Device has an Endpoint
 - Endpoint exposes a Control Interface
 - Application Task interacts with Media Device through the Endpoint Control Interface

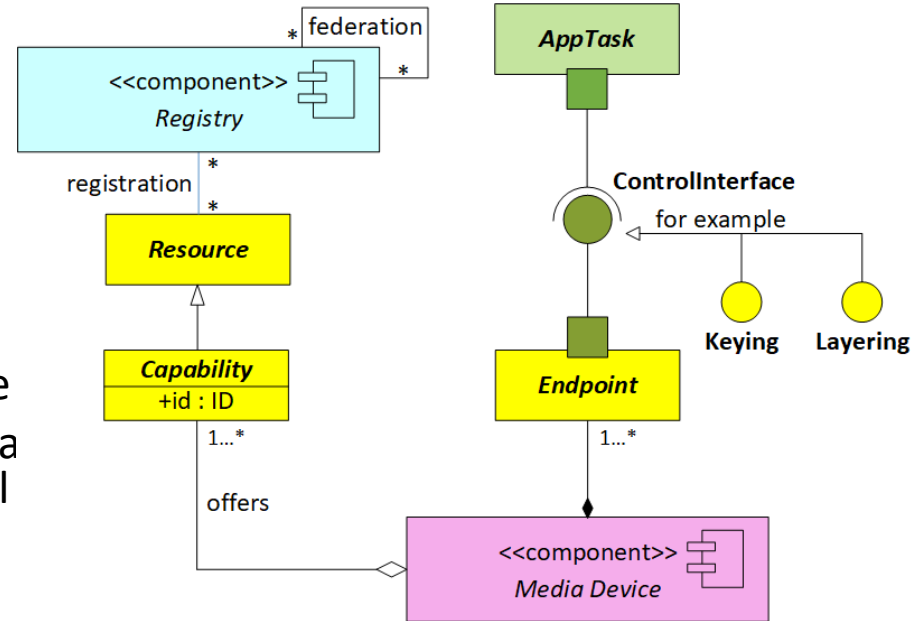


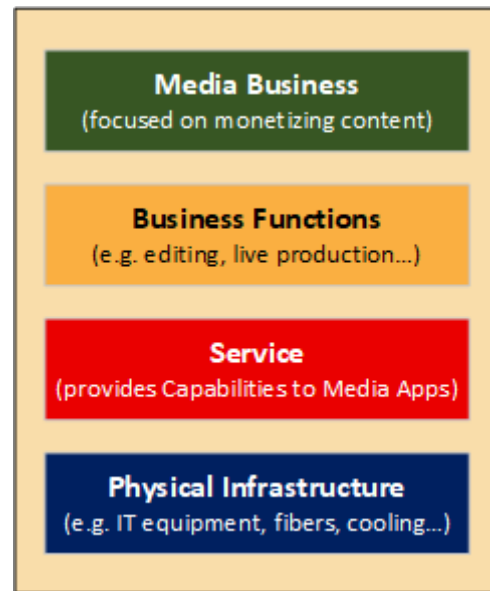
Figure adapted from JT-NM Reference Architecture

A worked example

THE DYNAMIC MEDIA SERVICE (DMS) ARCHITECTURE

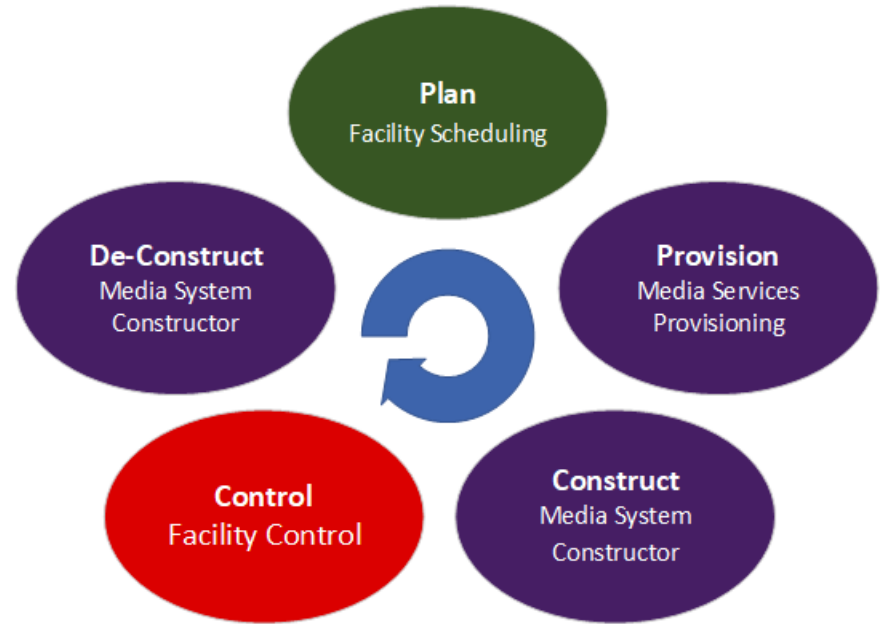
Media Business High Level View

- Conceptual view of any media business
- Technology agnostic
- Establishes key concept
 - *Services provide Capabilities to enable Business Functions*



Media Business Process Cycle

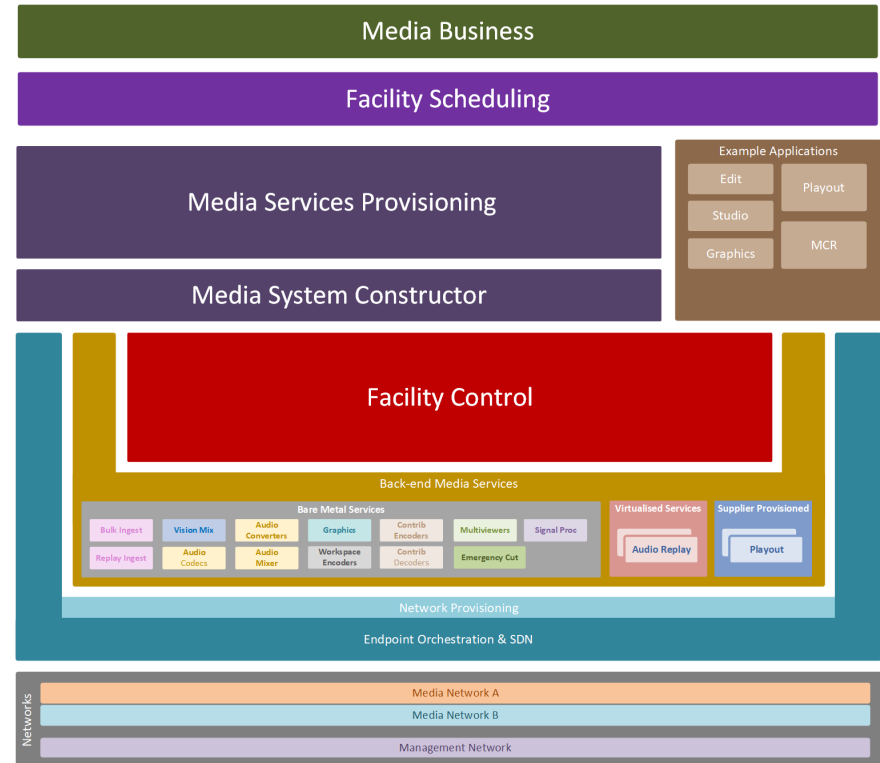
- Plan
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Dynamic Media Service Architecture

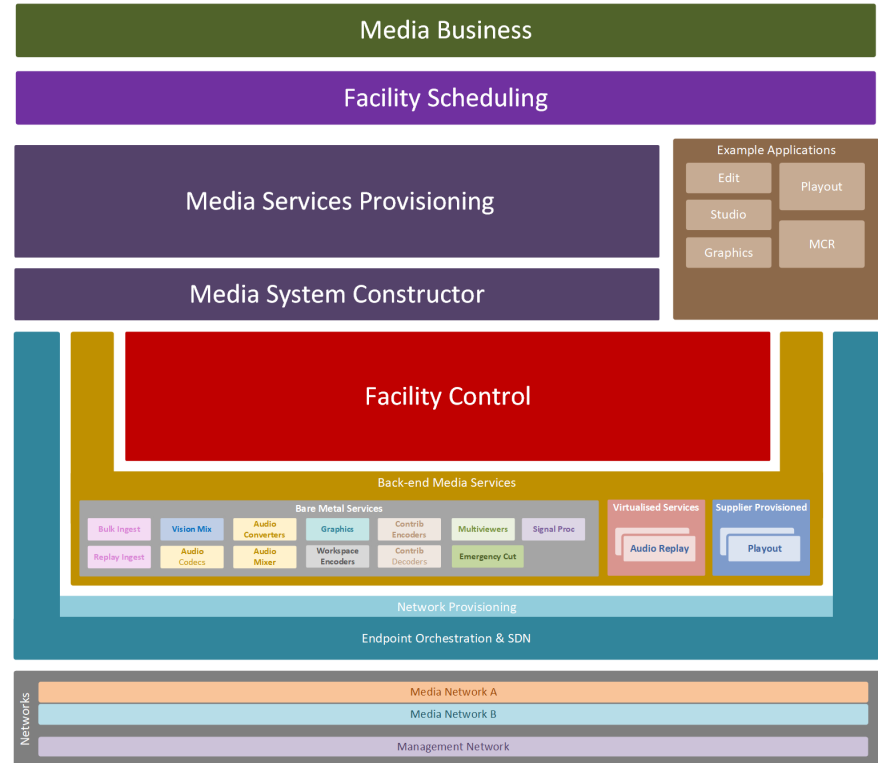
High Level View

- Planning
 - Facility Scheduling
- Provisioning
 - Media Services Provisioning (MSP)
- Construct
 - Media System Constructor
- Control
 - Facility Control



Planning & Contracting

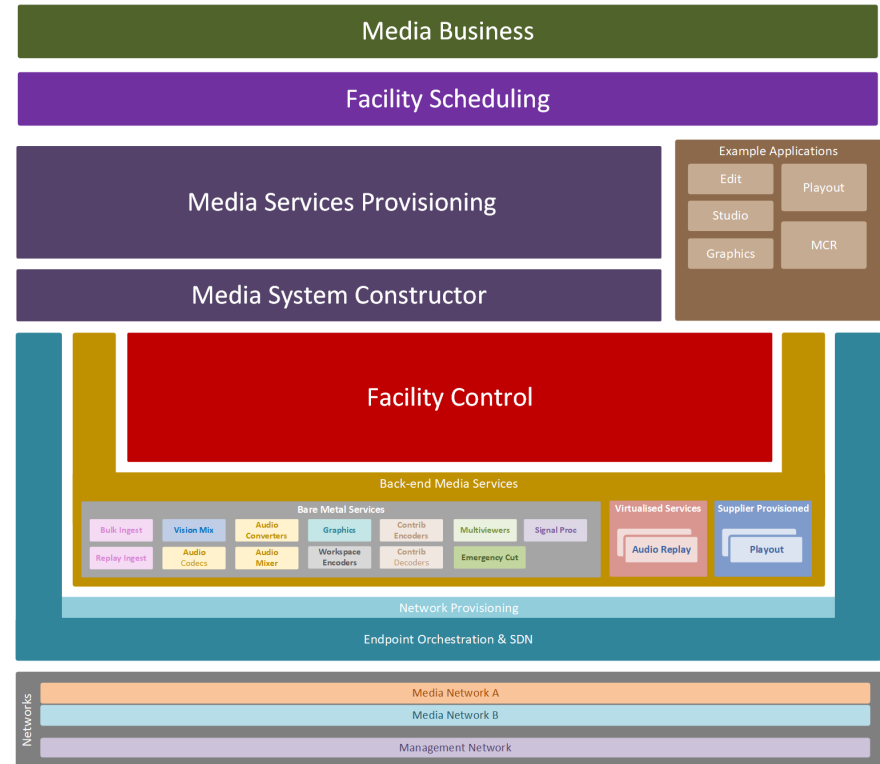
- Planning system requests a *kind* of resource
- Media Service Provisioning (MSP) checks resources and diary
- MSP issues contract for the resource



Dynamic Resource Allocation

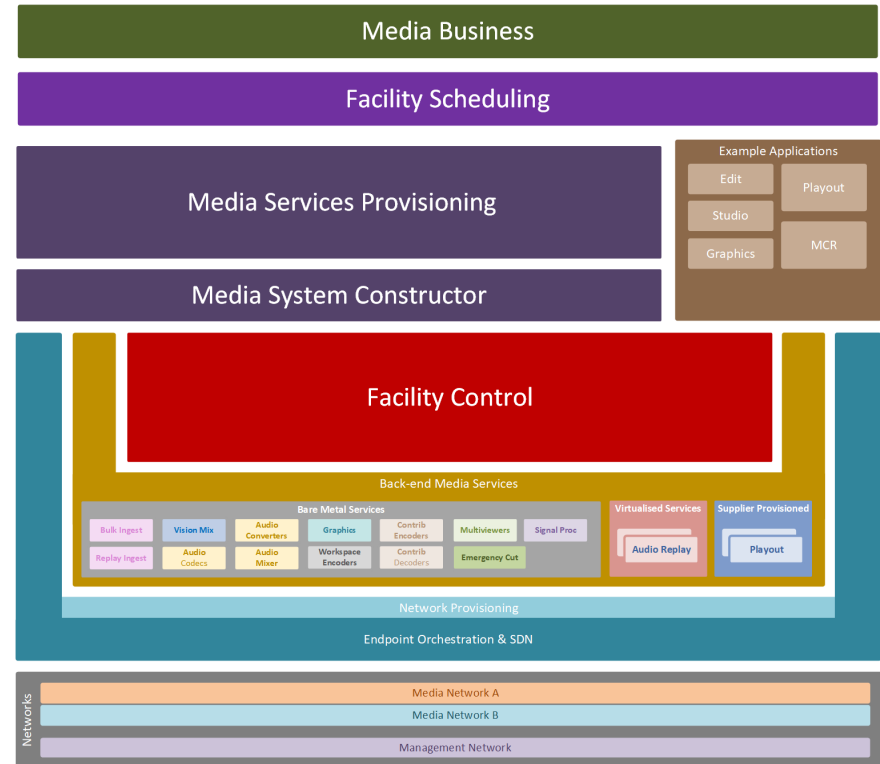
- Construct phase started by schedule or manually
- Media System Constructor queries MSP for the specific *instance* of the *kind* of resource guaranteed during the planning process
- Constructor then builds the workflow

**The MSP acts as a resolver,
resolving *kind* to *instance kind***

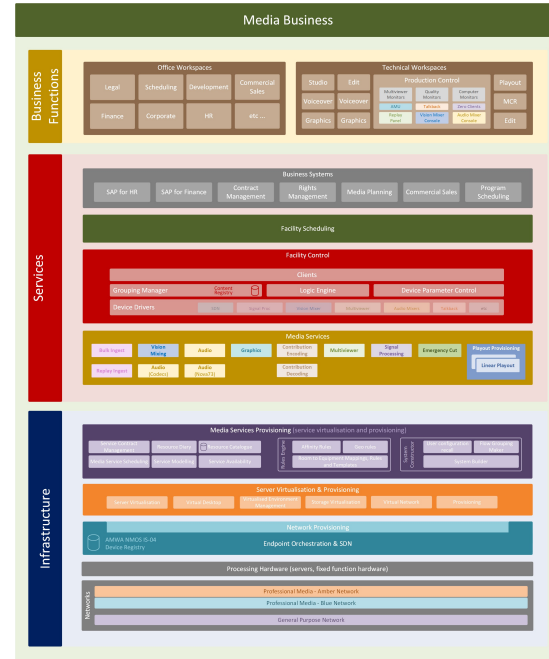
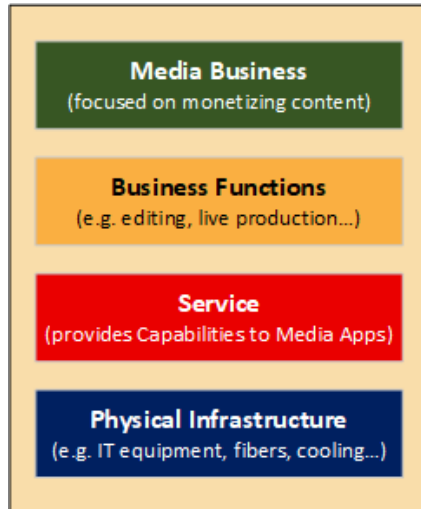


Dynamic Resource Allocation

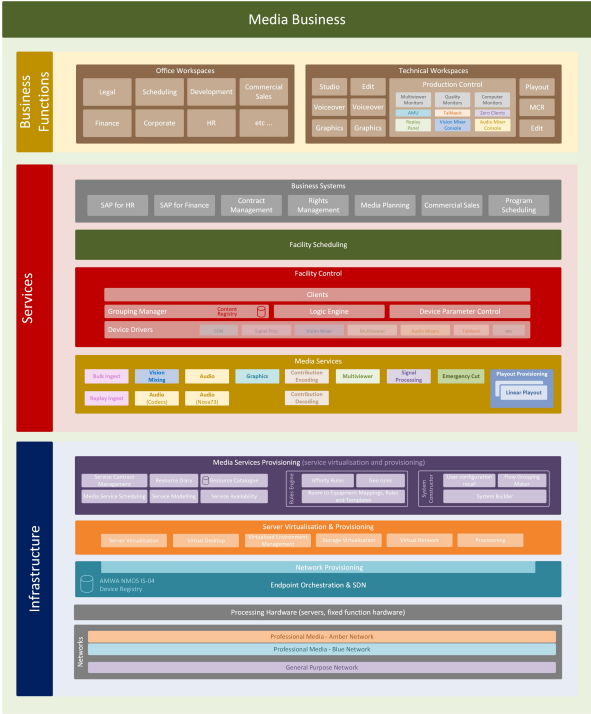
- Once Constructor is finished, the system passes to real-time Control applications (e.g. PCR, Edit, etc.)
- When finished, Constructor is called again to de-construct the workflow
- Services are released



Media Business & The DMSA



DMSA Reordered & More Detailed



Media Business & Business Functions Layers

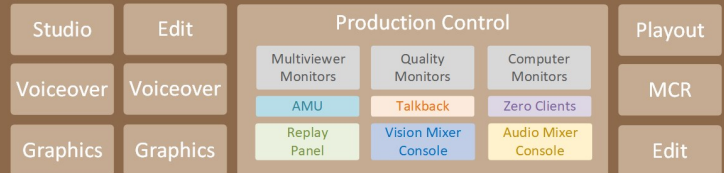
Media Business

Business Functions

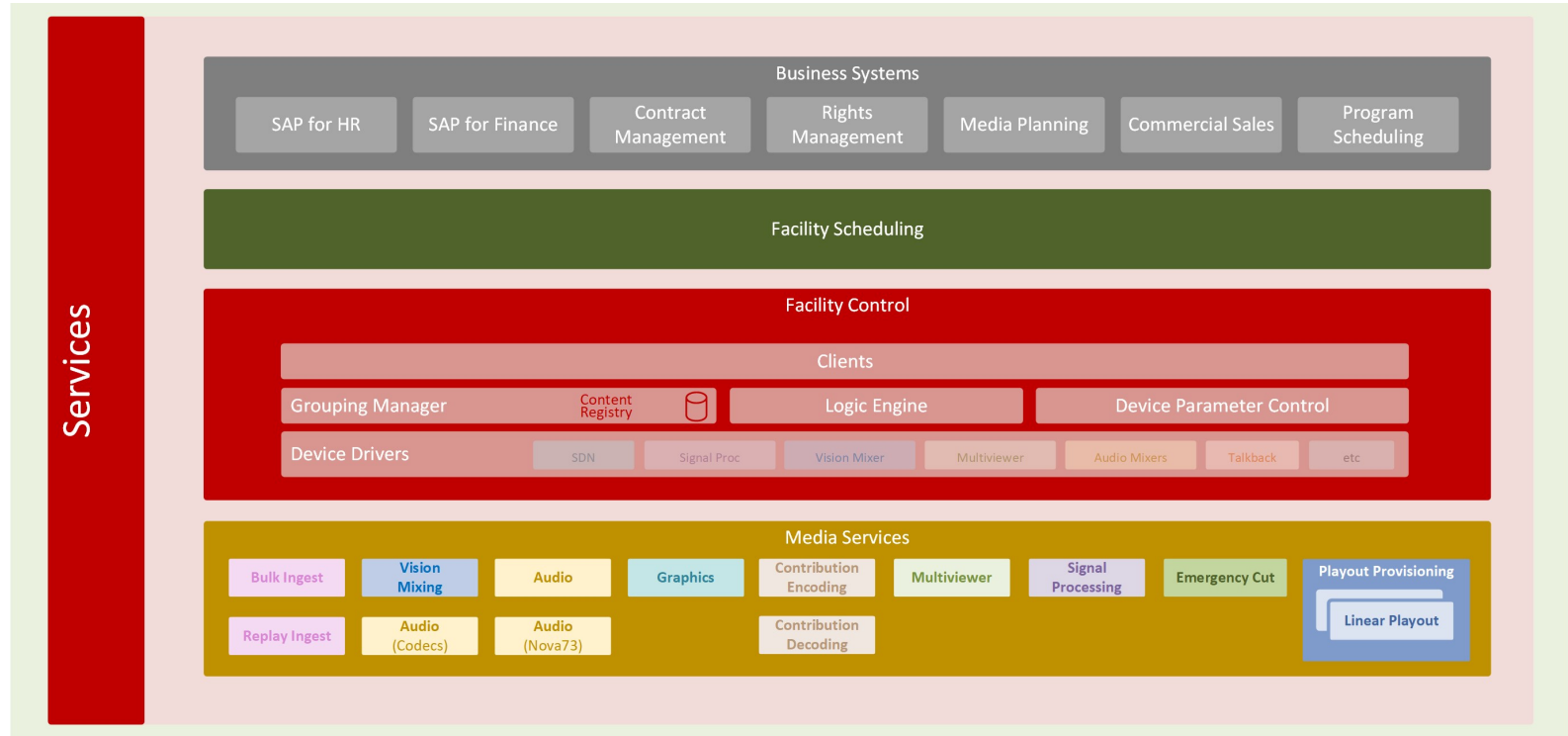
Office Workspaces



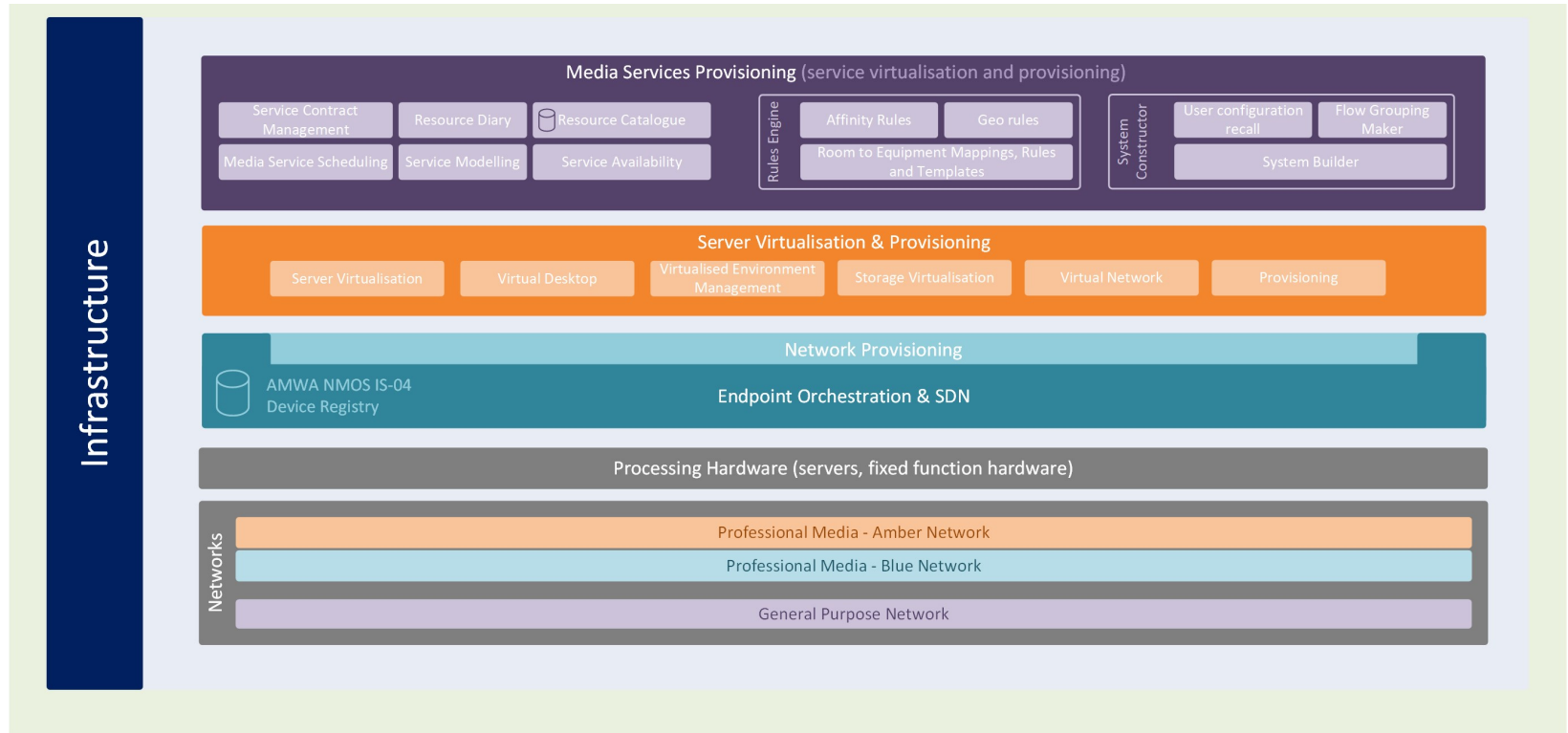
Technical Workspaces



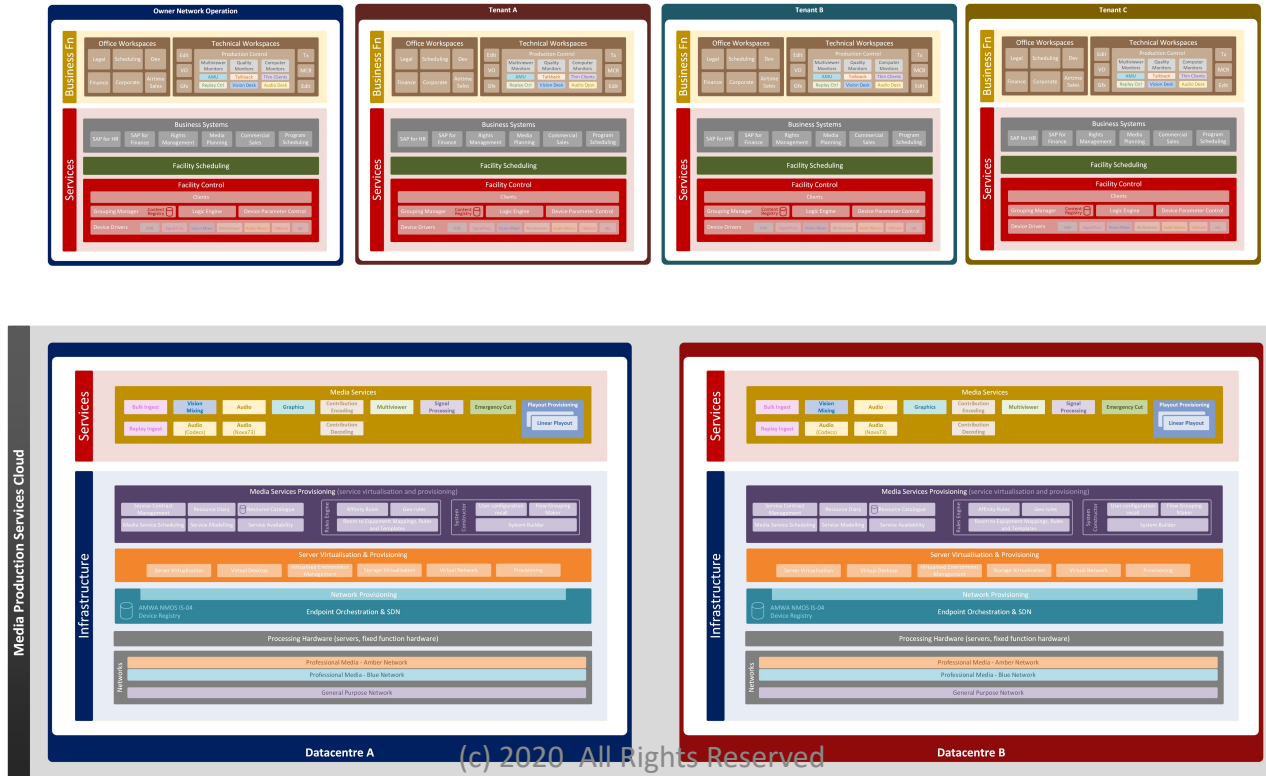
Service Layer



Infrastructure Layer



DMS Architecture Multi-tenant



Summary

- Adopt IT Thinking For Professional Media
- *Services* provide *Capabilities* to enable *Business Functions*
- Microservices with self-describing APIs enable the composable workflows
- Media Service Provisioning resolves general requests for a *kind* of service to a specific *instance* of a service

Brad Gilmer – Gilmer & Associates, Inc. (brad@gilmer.tv)

Grant Hammond – Hamond Consulting, Ltd. (grantrhammond@gmail.com)

QUESTIONS OR FOR MORE INFORMATION