IT Thinking For Professional Media

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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

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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

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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

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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

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THOSE STATEMENTS ARE THE VISION

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Practical Considerations

- We must stay on the air
- We must remain competitive
- We must have time to work through the changes required

Positive points about where we are now

- IP is required basic infrastructure change
- 2110 done right enables live production
- New skillsets are coming on line
- Self-testing is becoming a reality

If we want to move to IT, IP is an essential step along the way.

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Elephant In The Room

- IP is necessary but not sufficient to get us to the visions expressed at the beginning of this presentation

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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 (no HTTPs, no DNS/DHCP, no load balancing, etc…)
  - Not leveraging Internet technology
- How can users achieve the vision of flexible, composable facilities?
- What about Live?

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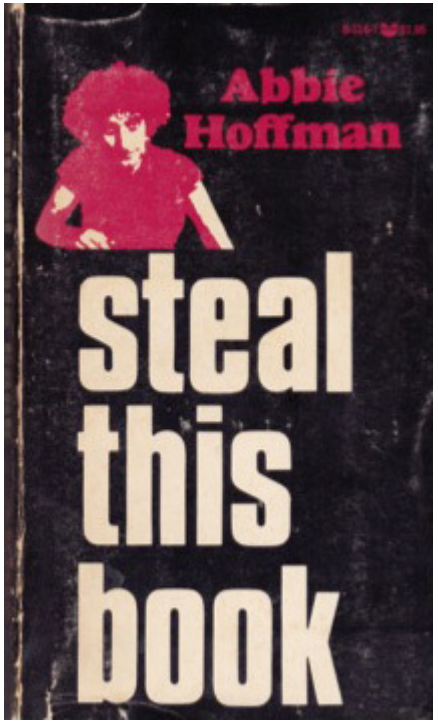
What's The Solution?

IT thinking for professional media

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



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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?

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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)

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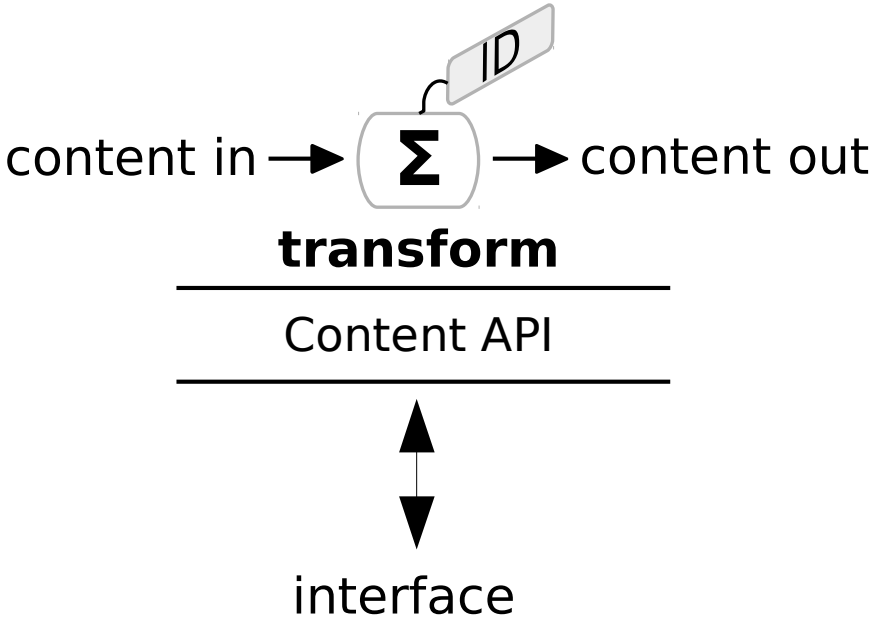
Composable Media Service

- 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…)



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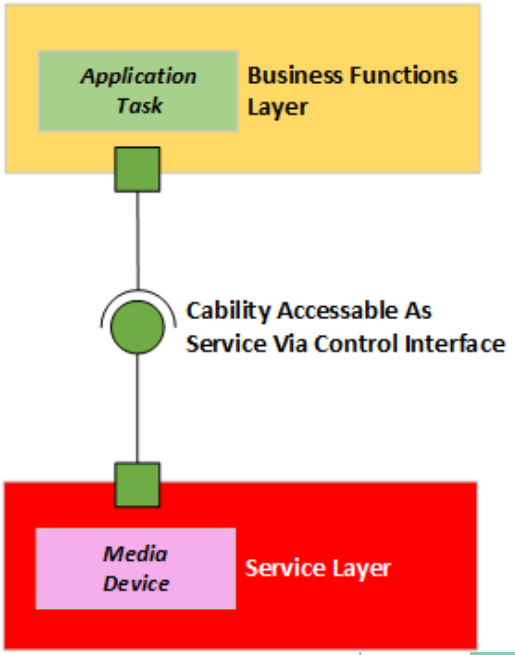
Simplified Service Exposure & Consumption

- 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



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USING MICROSERVICES

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Media Business Process Cycle

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

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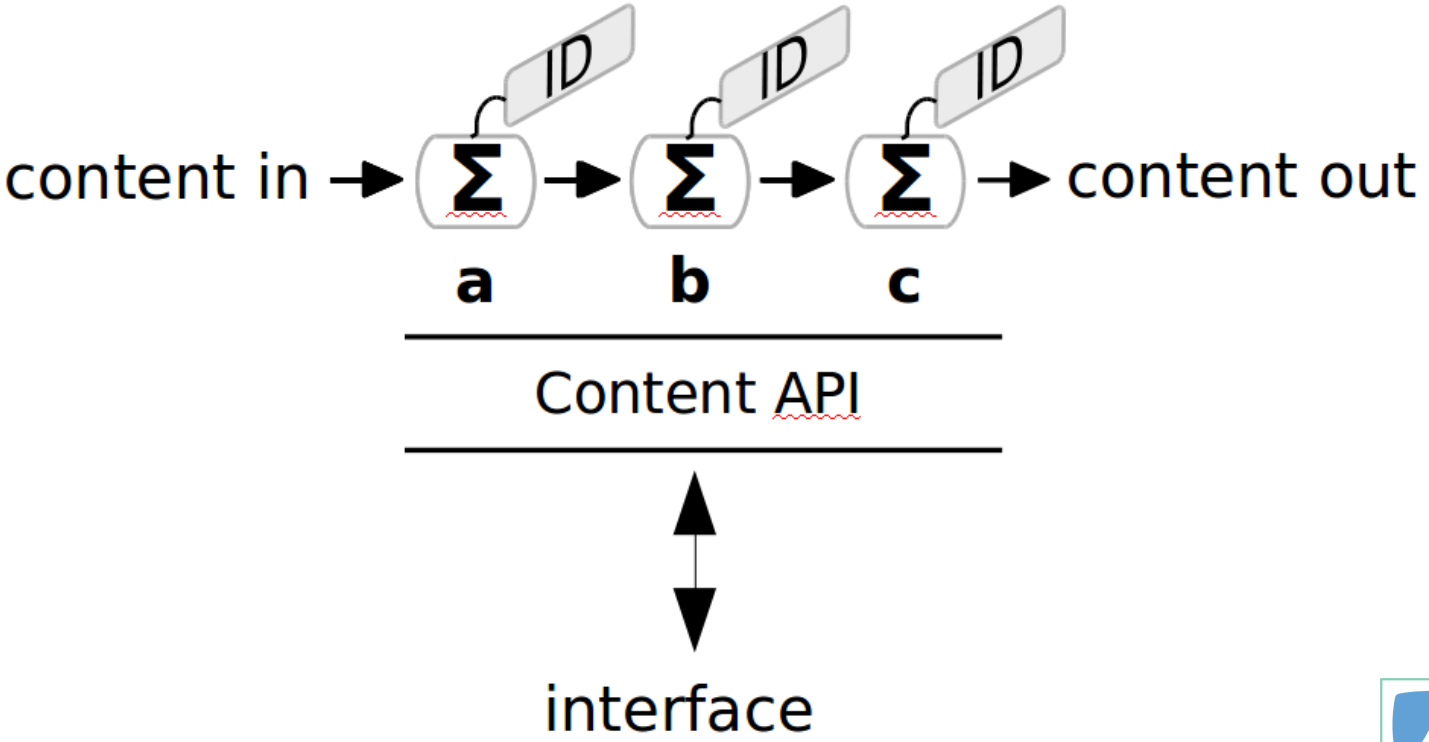
Composable Media Services



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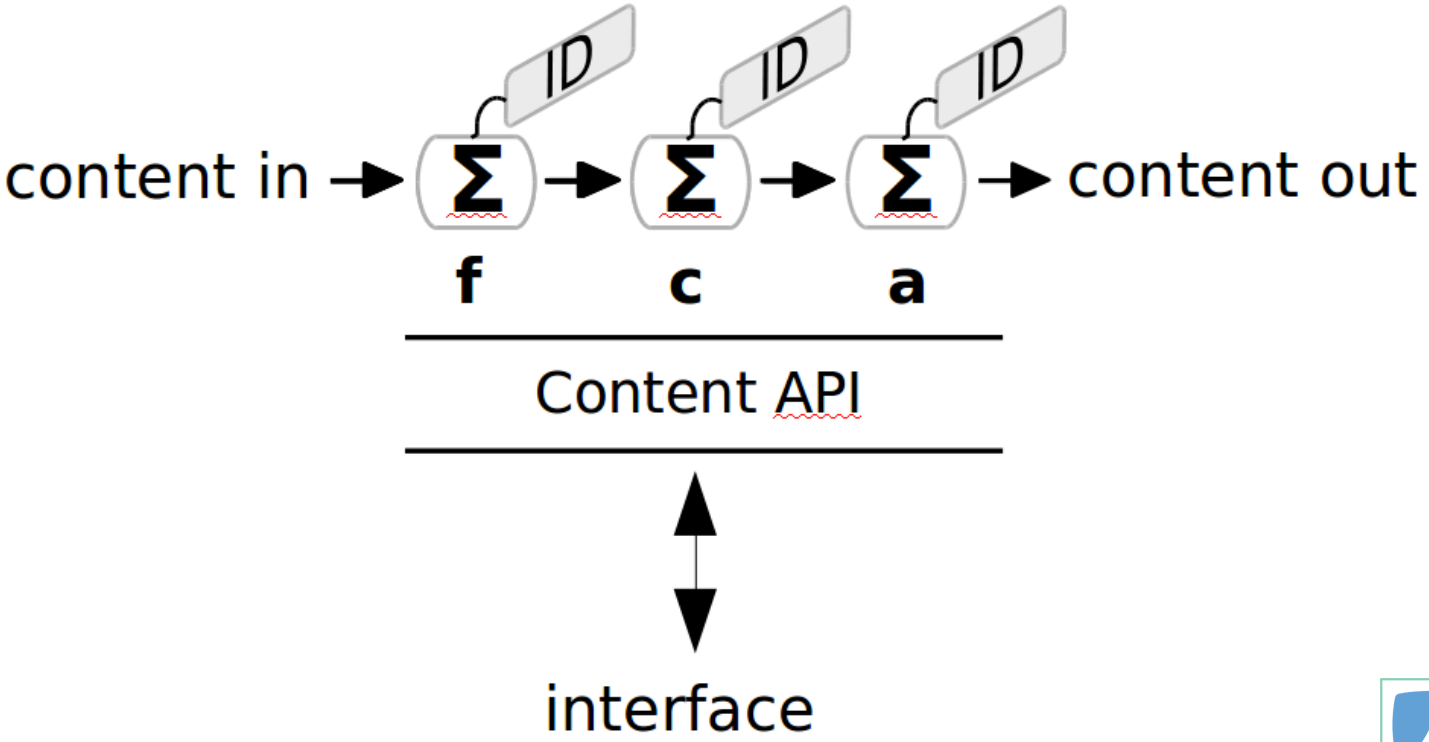
Composable Media Services



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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?

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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?

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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

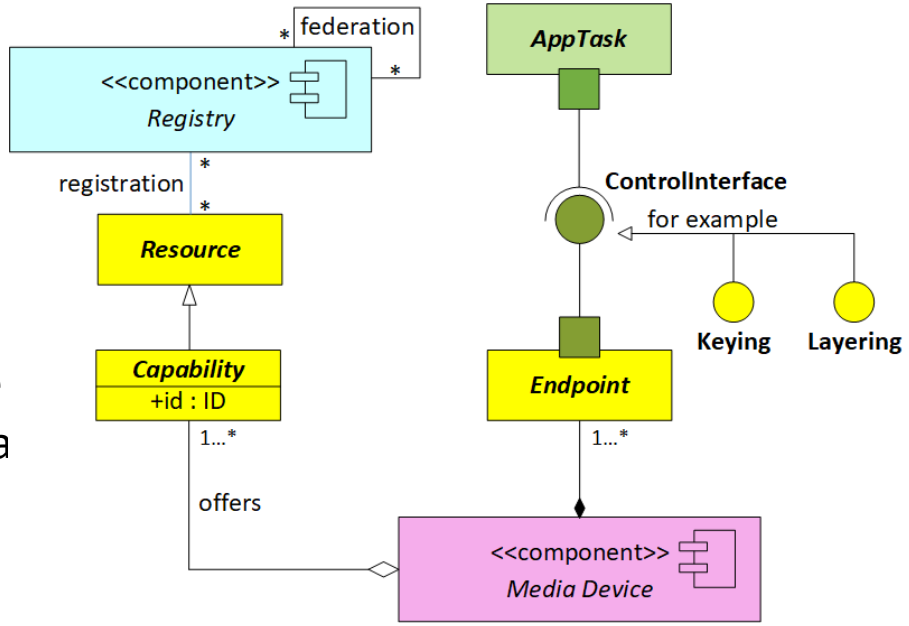

Figure adapted from JT-NM Reference Architecture

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IT for Professional Media -

A worked example

THE DYNAMIC MEDIA SERVICE (DMS) ARCHITECTURE

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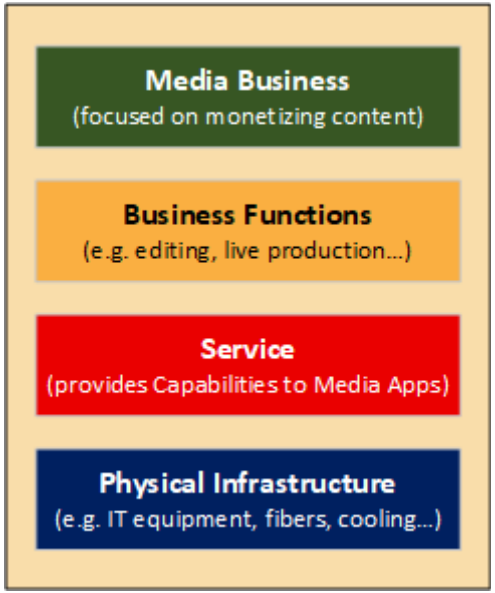
Media Business High Level View

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



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Media Business Process Cycle

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

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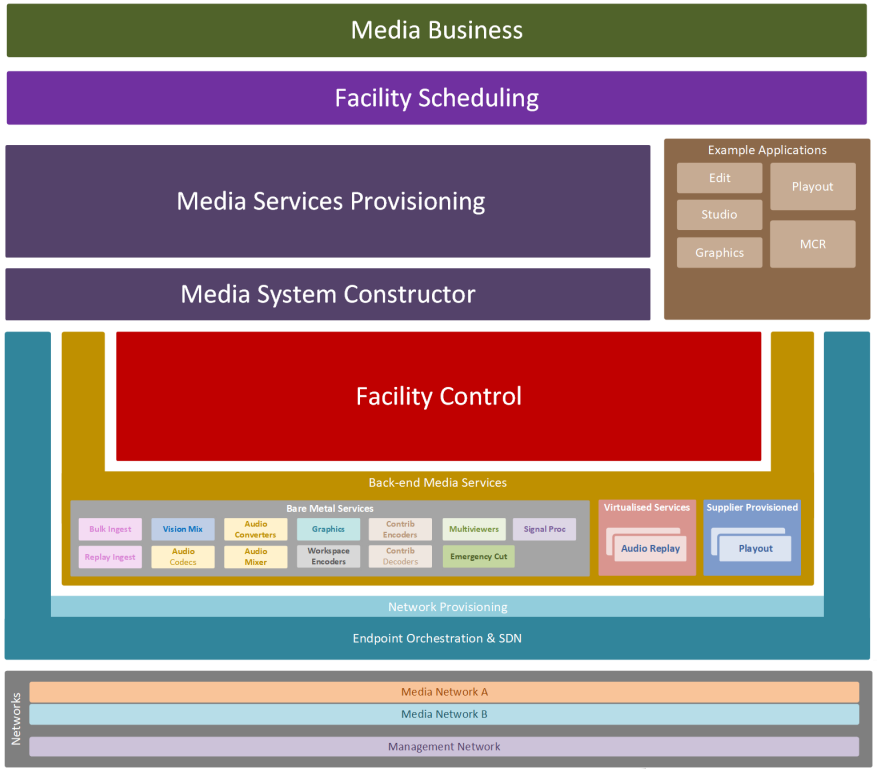
Dynamic Media Service Architecture

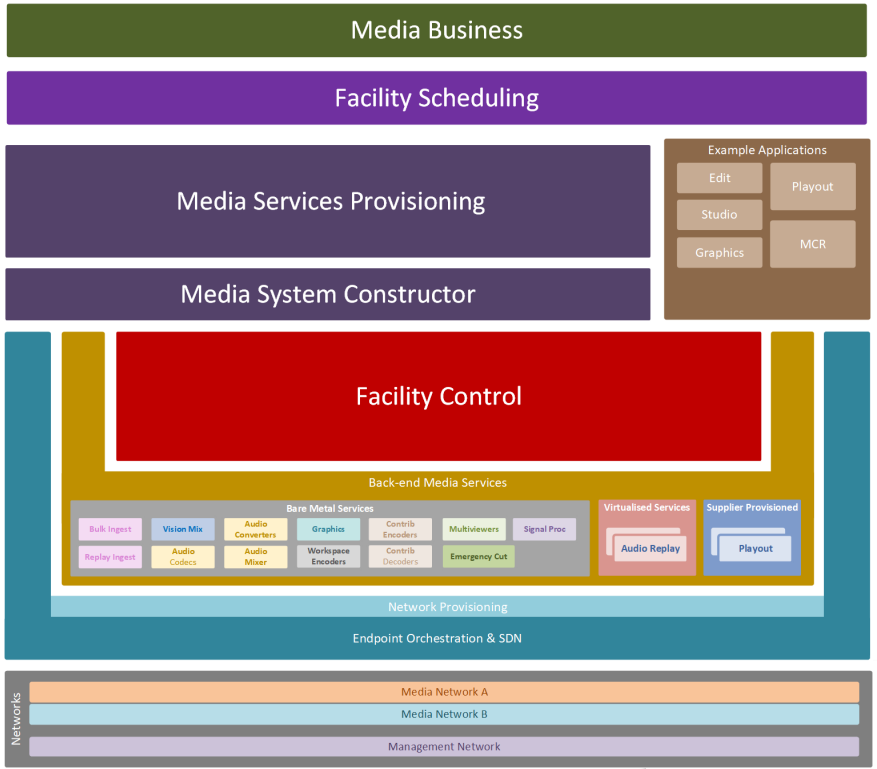
High Level View

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



Planning & Contracting

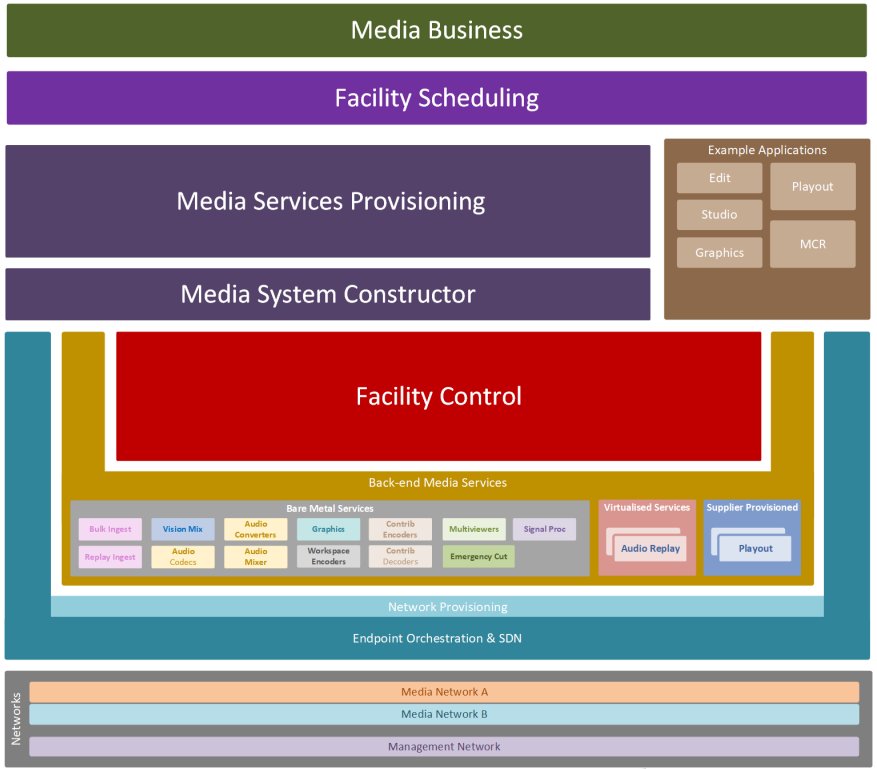
- Planning system requests a *kind* of resource
- Media Service Provisioning (MSP) checks resources and diary
- MSP issues contract for the resource



Dynamic Resource Allocation

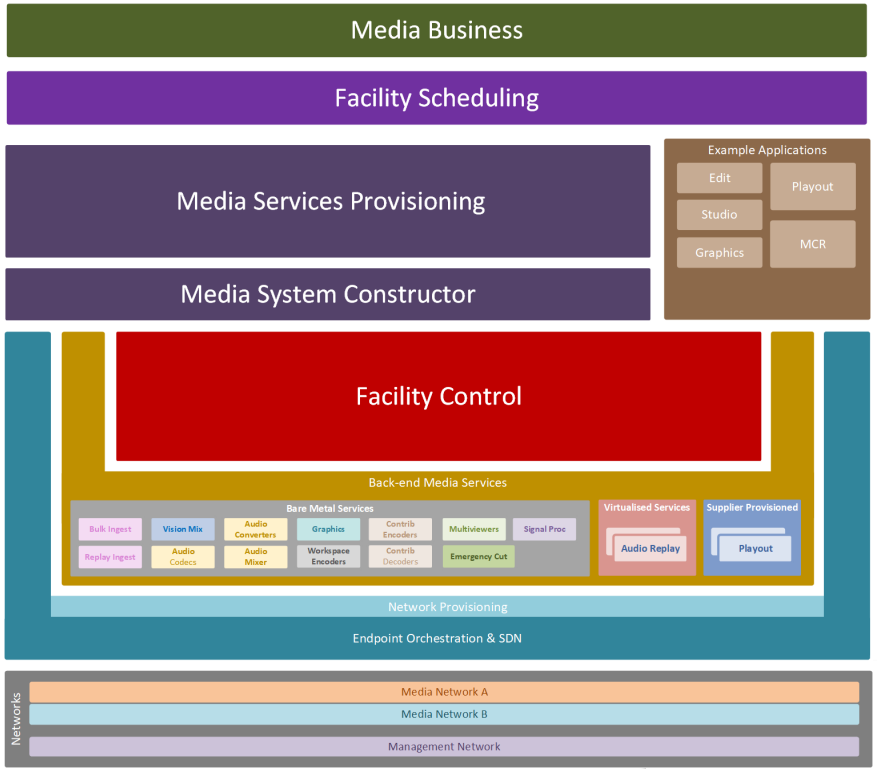
- Construct phase started by schedule or manually
- Media System Constructor queries MSP for the specific *instance* of the *kind* of resource guaranteed during the planning process
- Constructor then builds the workflow

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

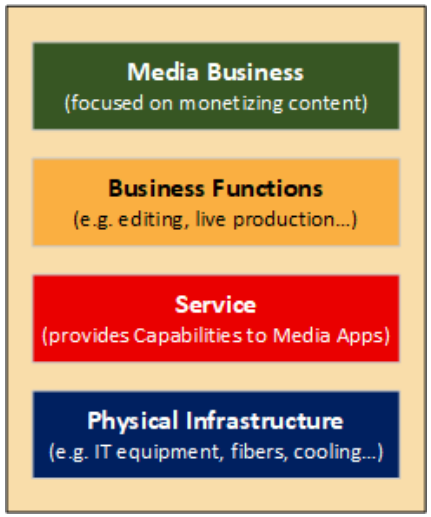


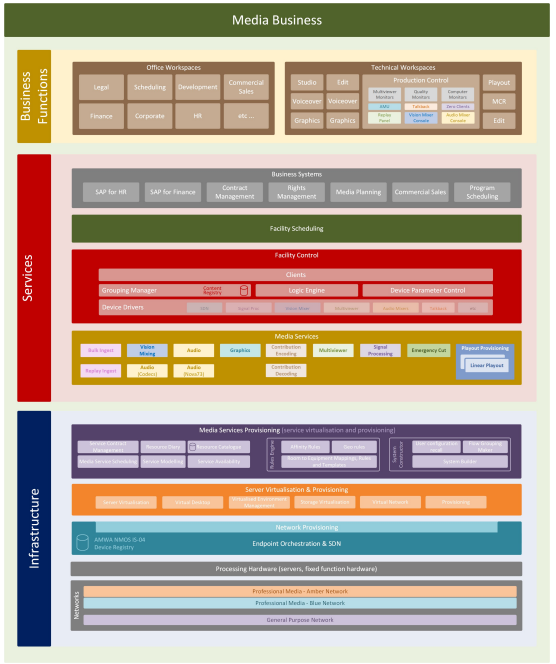
Dynamic Resource Allocation

- 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





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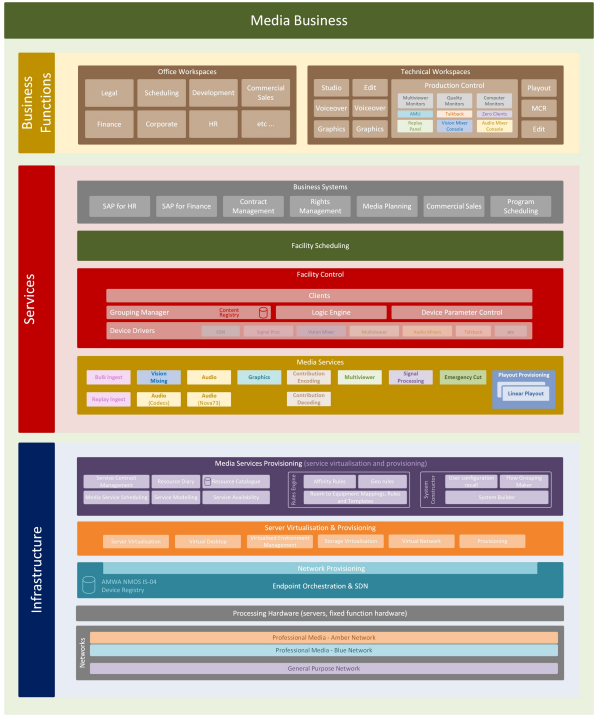
DMSA Reordered & More Detailed



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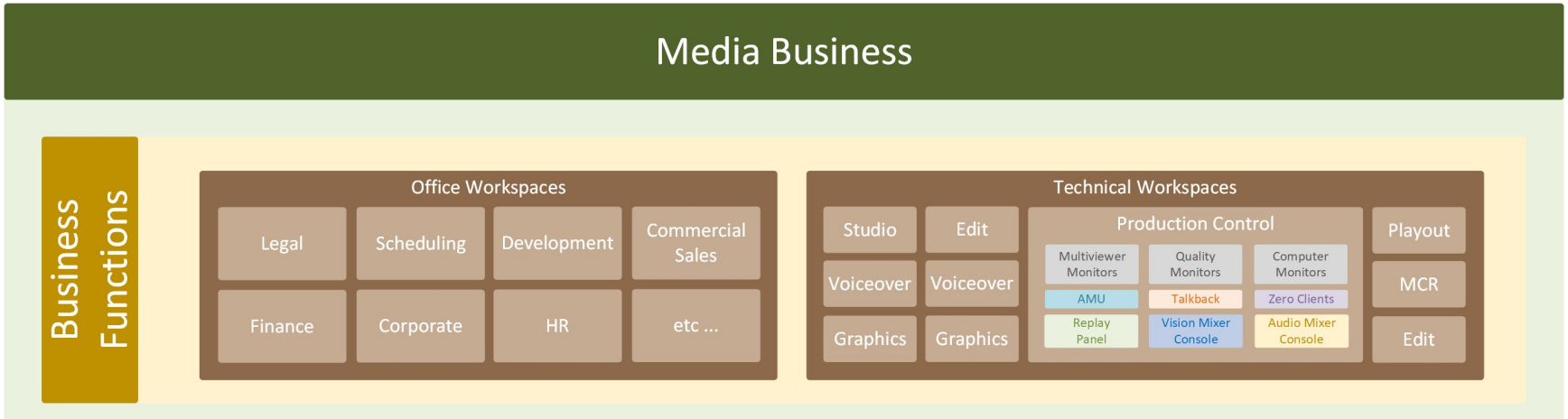
Media Business & Business Functions Layers



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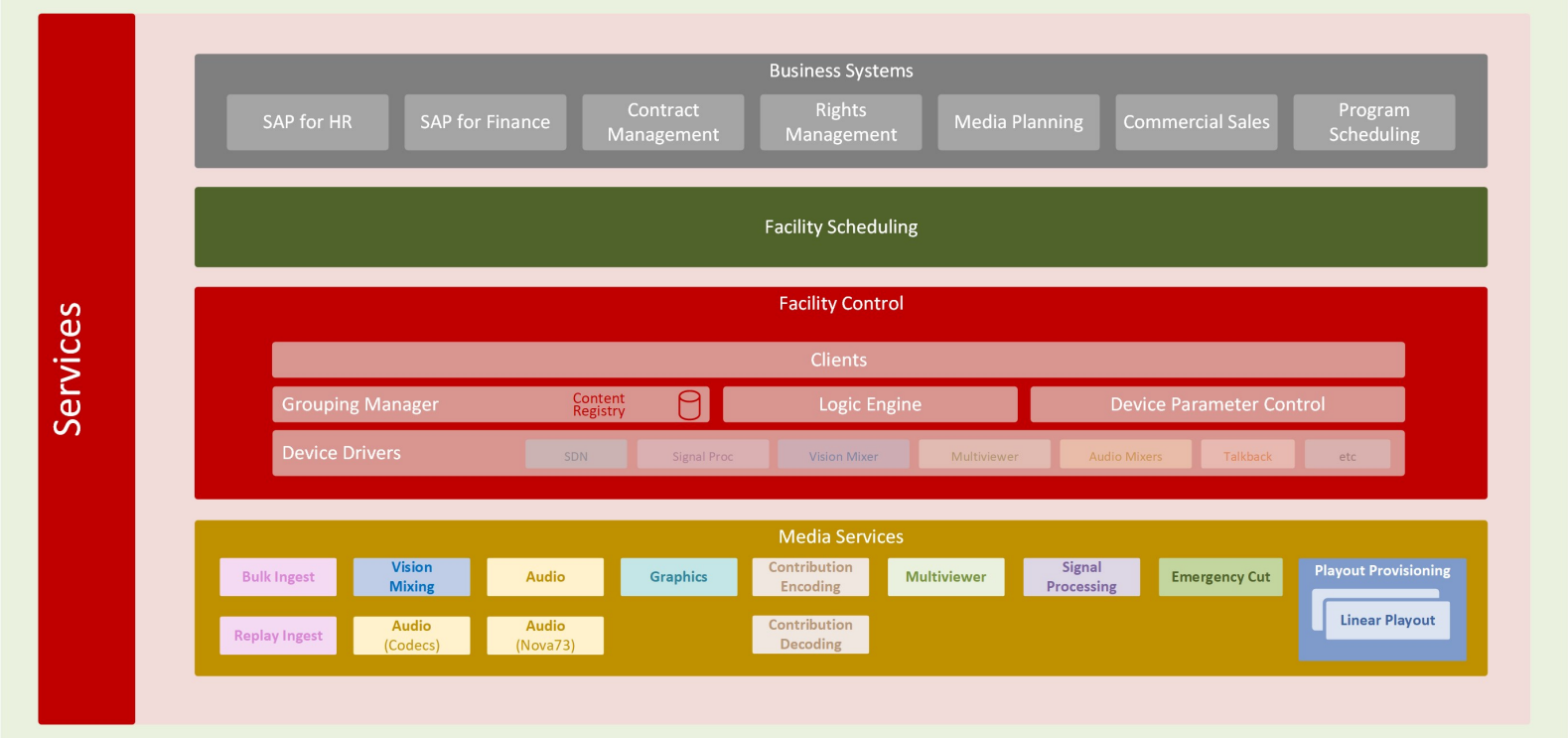
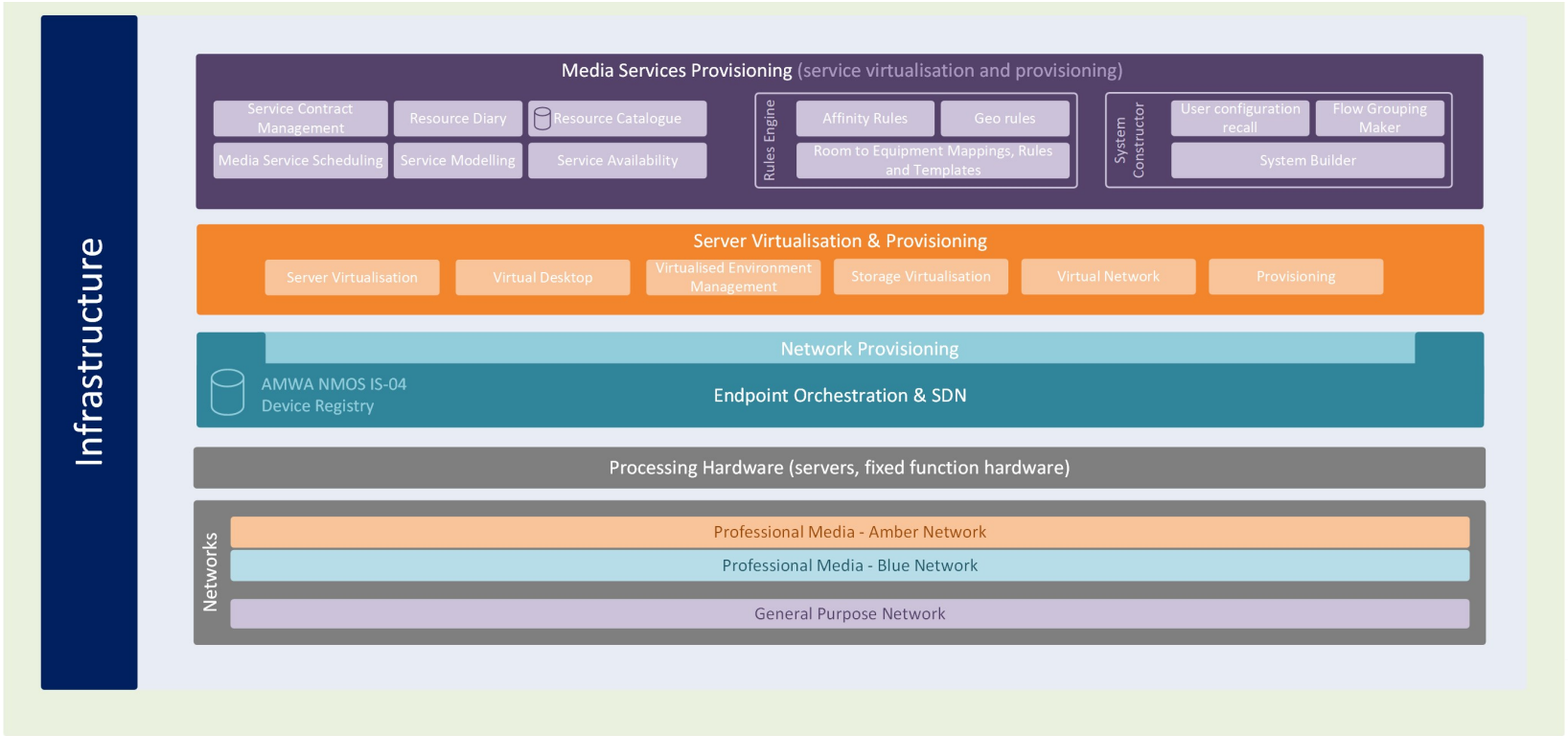
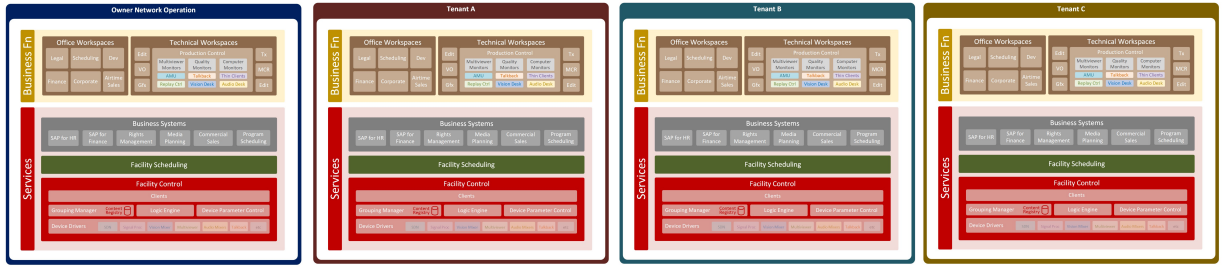
Service Layer

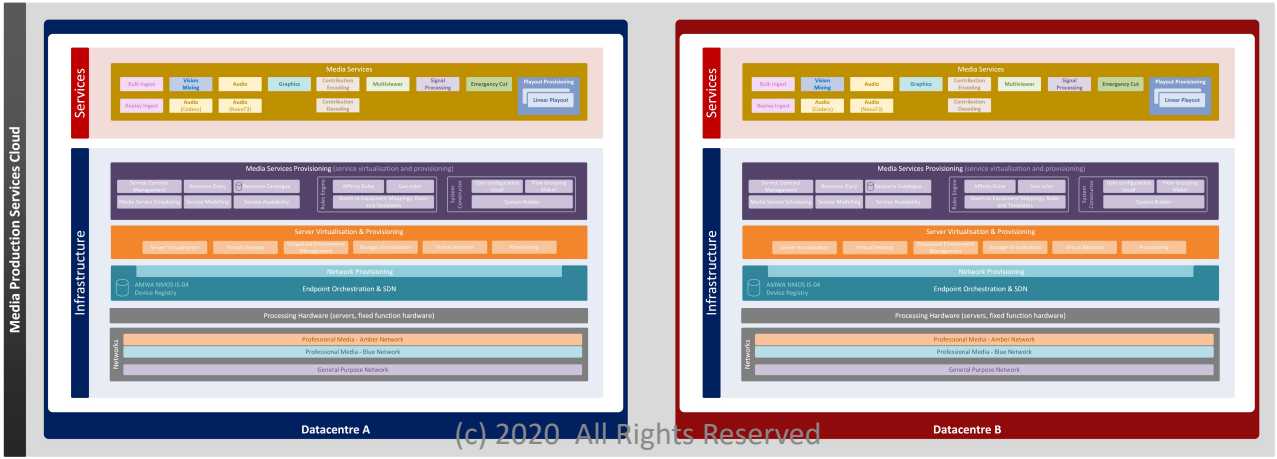


Infrastructure Layer



DMS Architecture Multi-tenant





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But What About Live?

- This architecture was actually developed for live.
- But yes, there are aspects of IT for Media that are problematic for live
- However, nothing is ever live at this point
- Only question is, “how much delay is acceptable”.
- If delay must be minimized, does this necessarily preclude using IT Thinking?

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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
- Adopt IT Thinking, even for live

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QUESTIONS OR FOR MORE INFORMATION

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