



FLAME

FACILITY FOR LARGE-SCALE ADAPTIVE MEDIA EXPERIMENTATION

FLAME: Platform, Infrastructures, and Foundational Media Services

Dirk Trossen

InterDigital Europe, Ltd

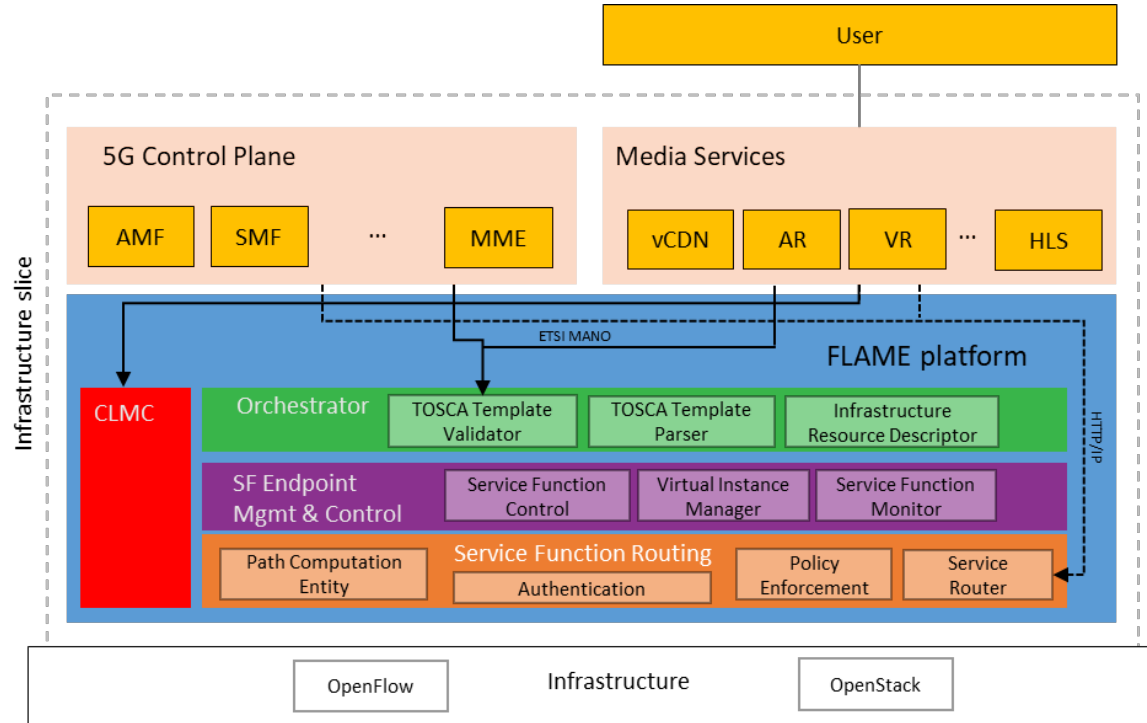
Open Call Webinar

12.12.2018

The FLAME Service Delivery Platform



- **A new dynamic content production and delivery platform**
 - Layered modular architecture with cross layer optimisation, analytics and control
 - Distributed computing models that combine distant media cloud with mobile edge, i.e., support for many points of presence
 - Deployed in software-defined infrastructure in minutes, supporting flexible service endpoint management, routing and switching
- **Supporting enhanced Quality of Experience**
 - Personalised, interactive, mobile and localised media services



Technical Proposition



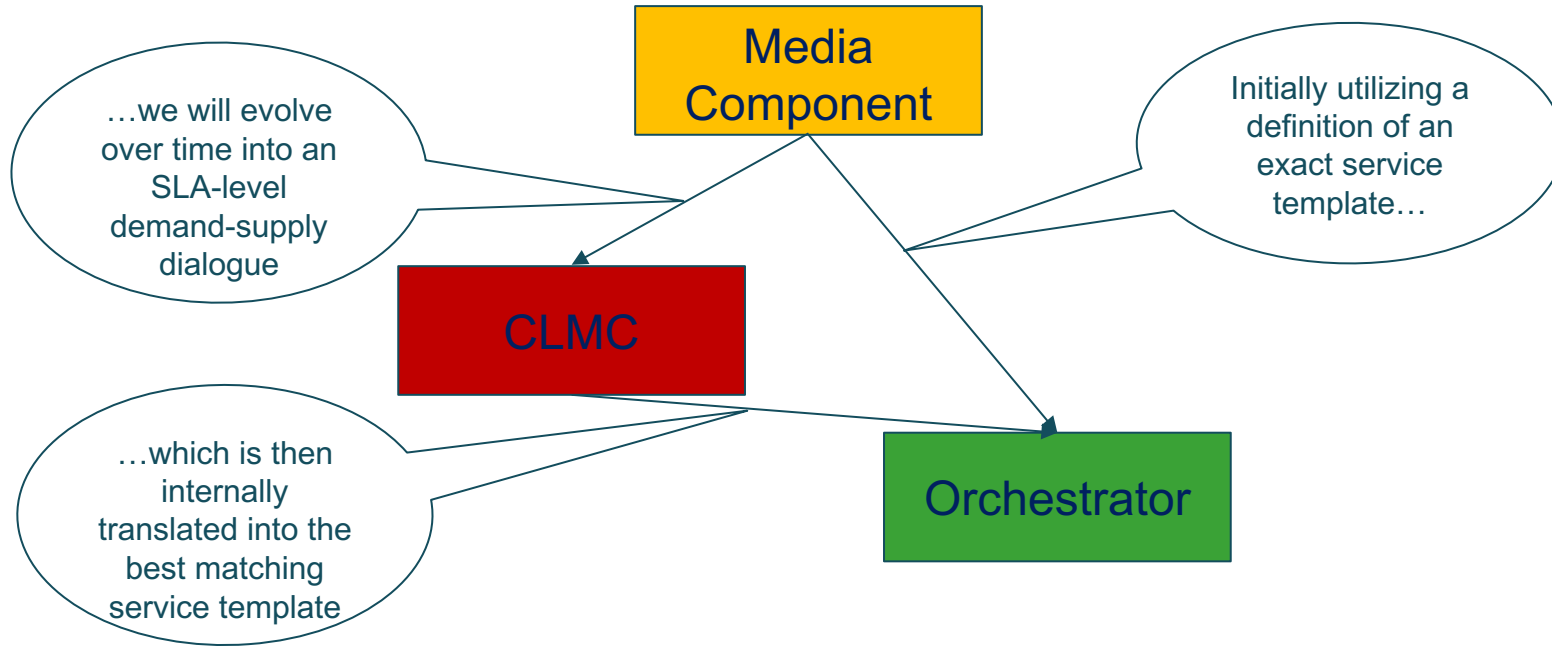
FAST, ADAPTIVE

- **Faster response, better engagement**
 - service deployment at the edge of the network (e.g. in a street cabinet)
 - compute located just one hop away (at best) from the users, low latency access
 - compute workload distributed across the network
- **Improved service request routing**
 - fast (between 10 and 20ms) switching time from one service instance to another by not relying on the DNS.
 - overcomes inefficient 'triangular' routing of requests in current IP networks
- **Multicast delivery of http responses**
 - multicast-based delivery of HTTP responses to service request transparently to the (otherwise unicast) semantic of HTTP transactions.

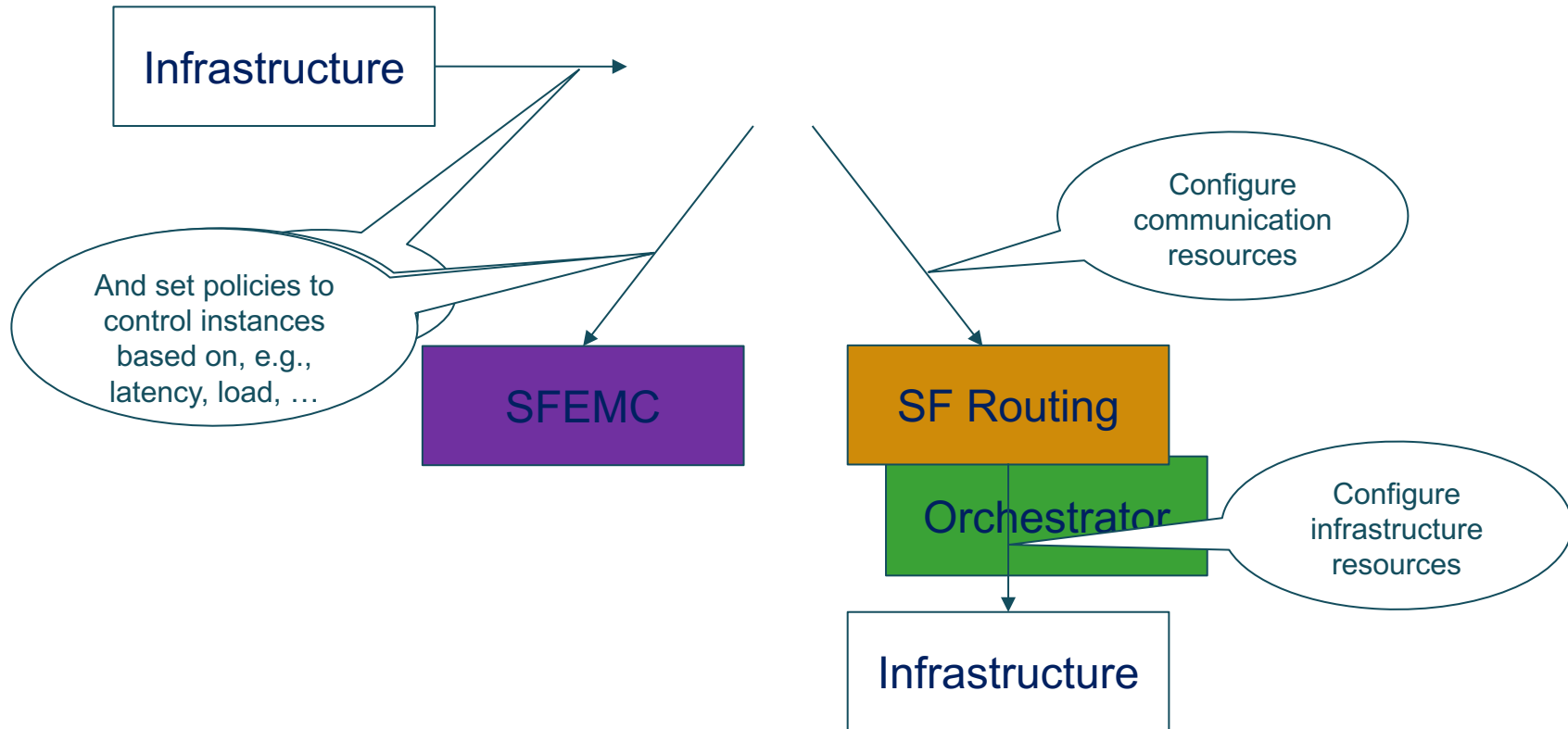
ROBUST, SECURE

- **Net-level indirection**
 - indirection of service requests at the network level allowing error response to redirect the original request to another alternative surrogate
 - nesting operations leads to a net-level 'search' among all available surrogate instances
- **Less chance of insecure direct object references**
 - CDNs morph into surrogate service endpoints with the potential to hold the necessary security context when serving the desired content
- **Secure end-to-end access to content**
 - CDNs deployed as properly secured endpoints with the necessary certificate sharing between content
 - Securing content delivery according to the originally intended end user facing contract -more secure for provider and consumer.

An Increasingly Rich Dialogue between Experimenter & Platform



Supported by Flexible Management and Control



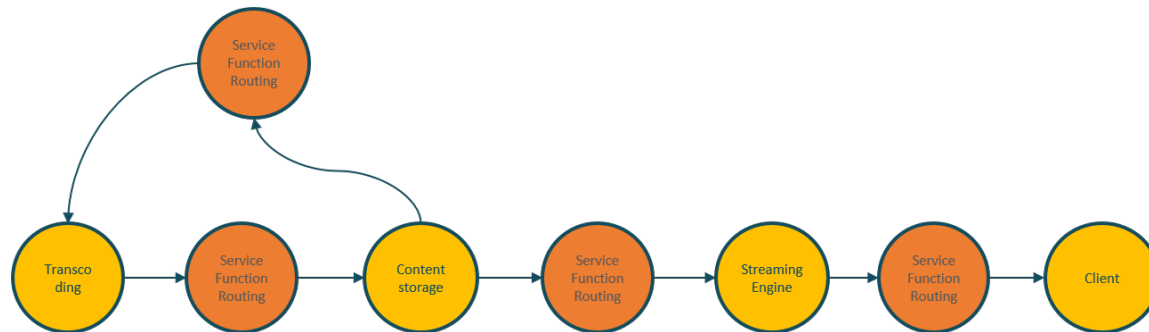
FLAME Foundational Media Services

- **Role of Foundational Media Services**

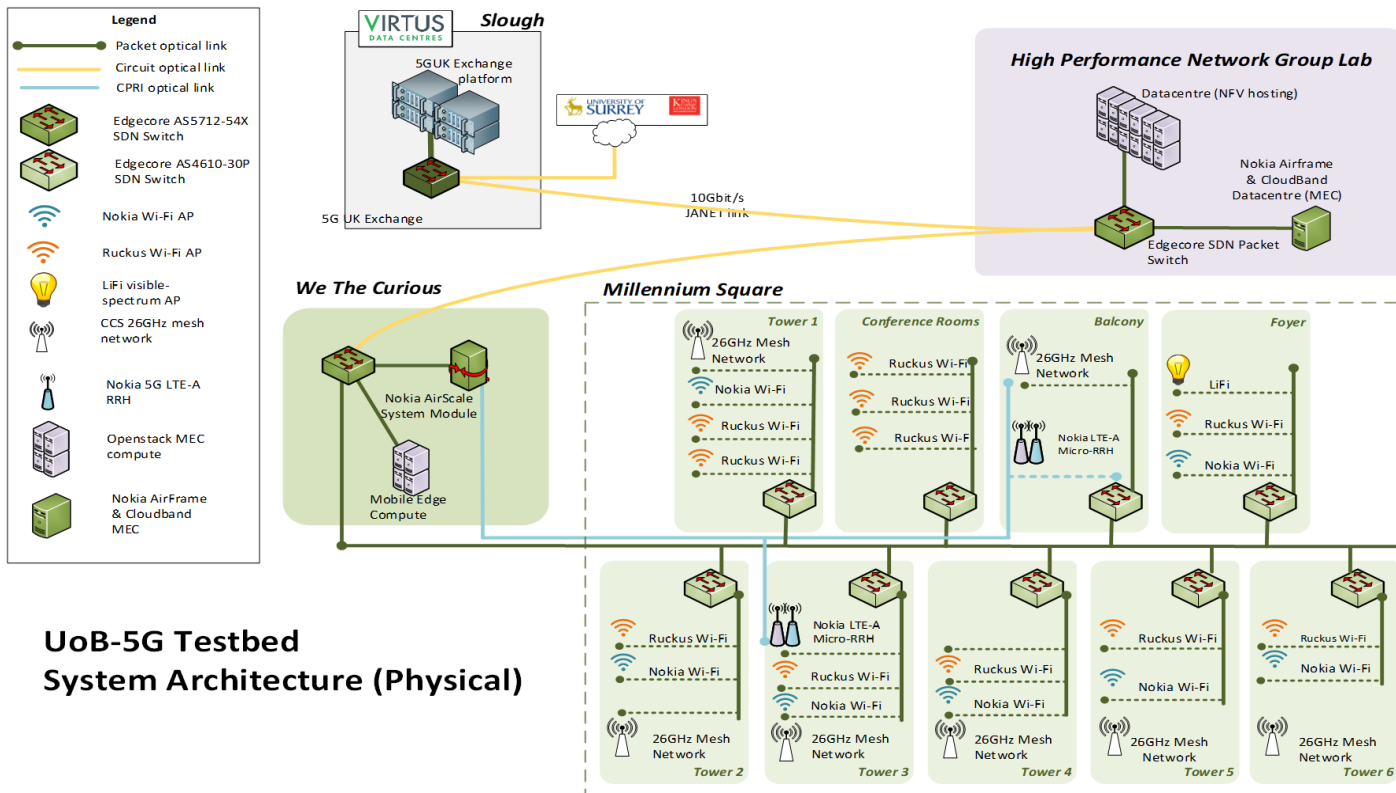
- *Support experiments* through providing basic building blocks
- *Take advantage* of FLAME platform capabilities, e.g.,
 - Multicast, e.g., replication
 - Indirection, e.g., replication
 - Chaining, e.g., flexible transcoding
- Provided as FLAME-instrumented images and orchestration template definitions

- **Current offering**

- Metadata database
- Adaptive streaming
- Content conditioning, including transcoding/transrating
- Content ingest and storage
- Media quality analysis
- Virtual CDN

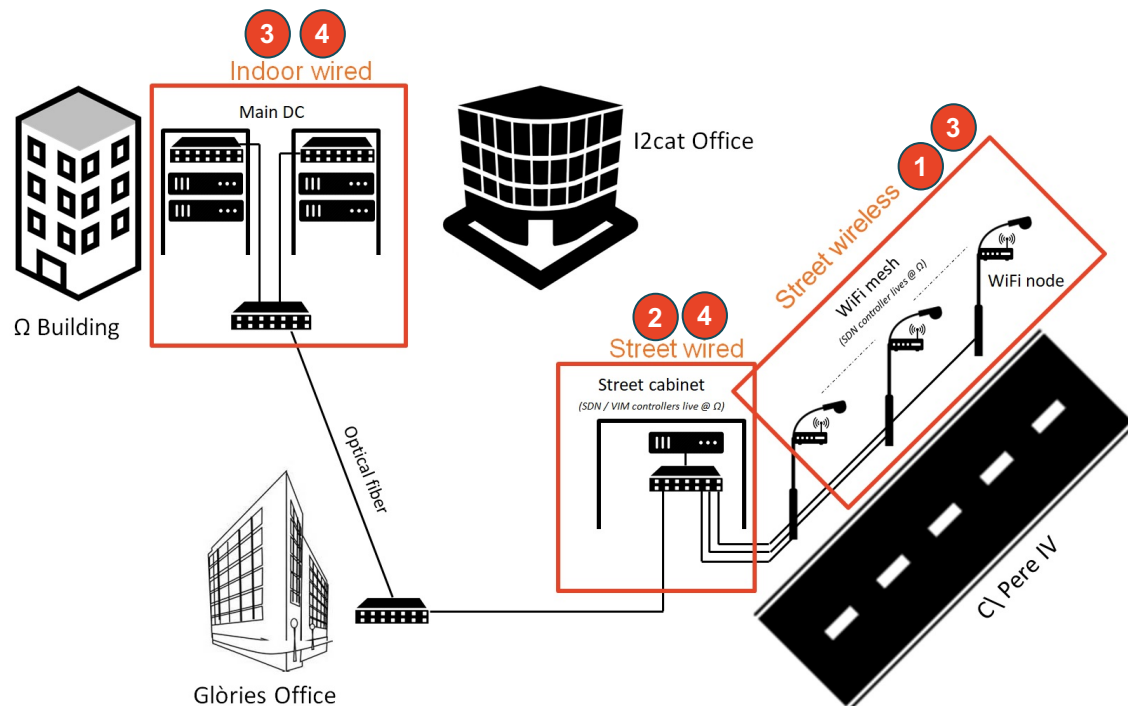


Deployment in Bristol



UoB-5G Testbed System Architecture (Physical)

Deployment in Barcelona



- 1 High speed radio access with mobility support
- 2 Edge computing capabilities
- 3 SDN/ICN technology to achieve multicast gains
- 4 Integration with FLAME platform for automatic service provisioning through NFV