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A Context-Adaptive Content Ecosystem Under Uncertainty (CONCERT)

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University College London

concert

UCL

Outline

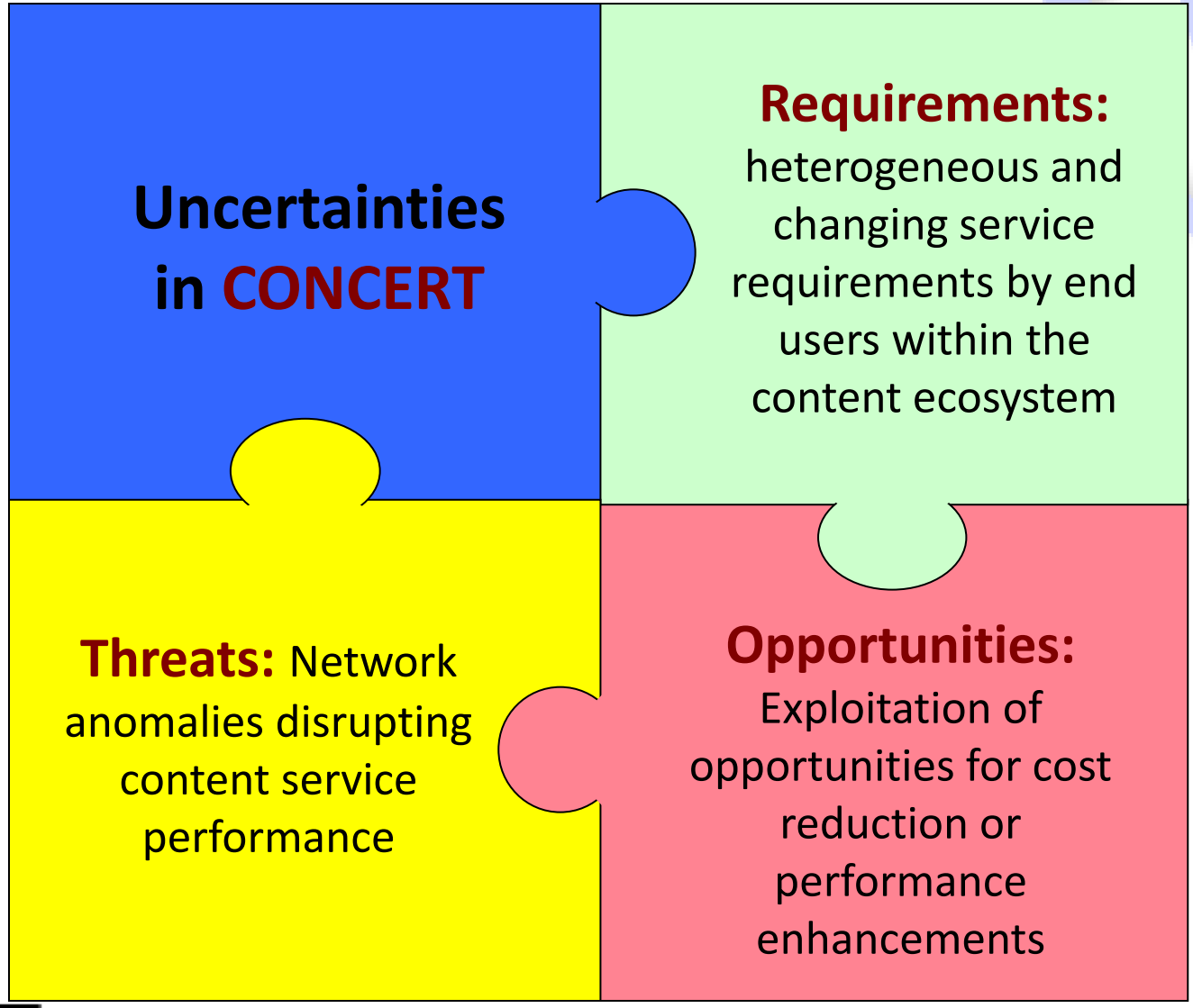
- Project Overview
- Project Objectives
- Application Scenarios
- CONCERT Framework
- Project Consortium & Organization

Project Overview

- CONCERT aims to develop a context-aware content ecosystem encompassing all relevant players which will be able to perform intelligent content and network adaptation in highly dynamic conditions under uncertainty.

- This ecosystem will have as basis emerging information-/content-centric networking (ICN) technologies.
  - Centered on information (*what*) instead of host locations (*where*)
  - Content-based resolution and delivery based on names
  - Support intrinsic in-network content manipulation (data caching/storage and processing)

Three Dimensions of Uncertainty



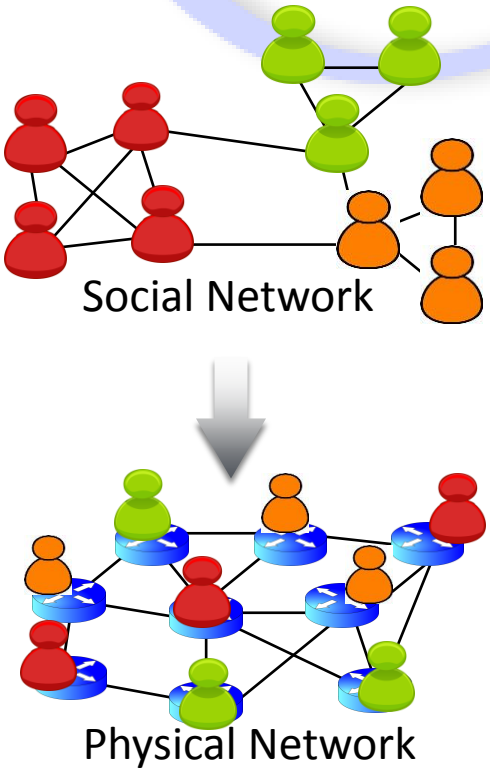
Project Objectives

Overall objective: to devise and evaluate a context-aware content ecosystem to holistically manage and exploit uncertainties in future, dynamic, content-oriented network environments.

- To define the context information, its representation and communication interfaces for context exchange among the content ecosystem players.
- To research into learning algorithms and coordinated decision-making techniques for supporting content and network adaptation functions.
- To develop algorithms and techniques for enabling cross-layer and cross-player content and network adaptations in dynamic environments.
- To validate and evaluate the proposed content ecosystem in the context of defined uncertainty scenarios

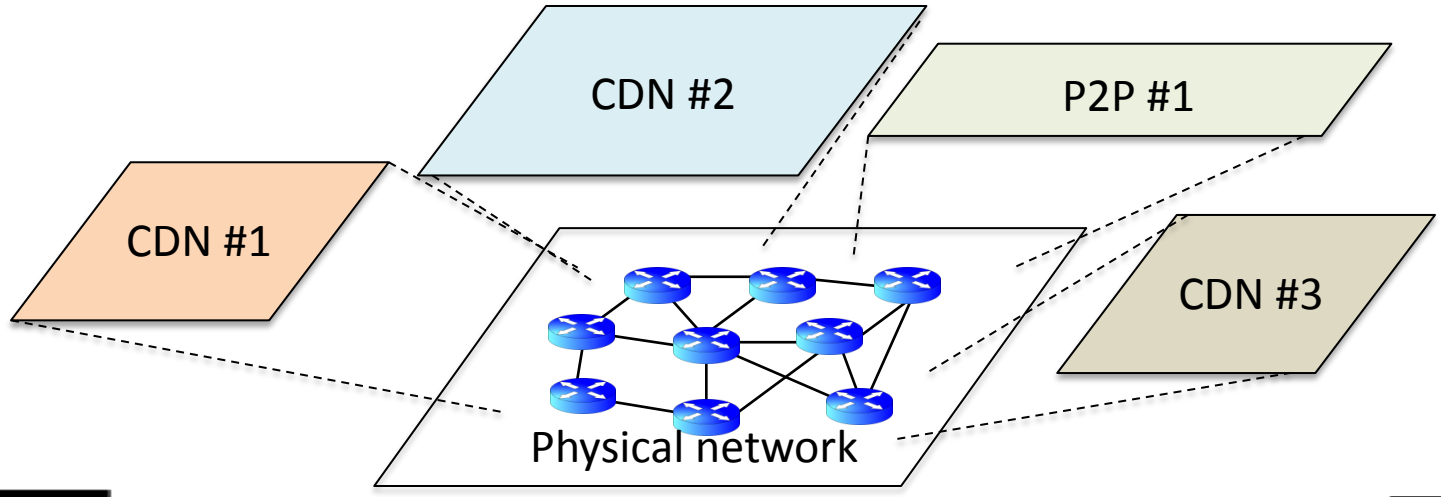
Application Scenario #1: Social Media

- Collection and dissemination of (social) context information
- Coordination of user connections and video distribution
- Exploitation of source correlation to improve the overall content distribution
- Network adaptivity to users interactivity and social connections
- Delay tolerant user-generated content (UGC) applications based on UGC pushing
- Exploiting (mobile) user terminals with caching capabilities to achieve controlled epidemic spray of UGC to interested consumers

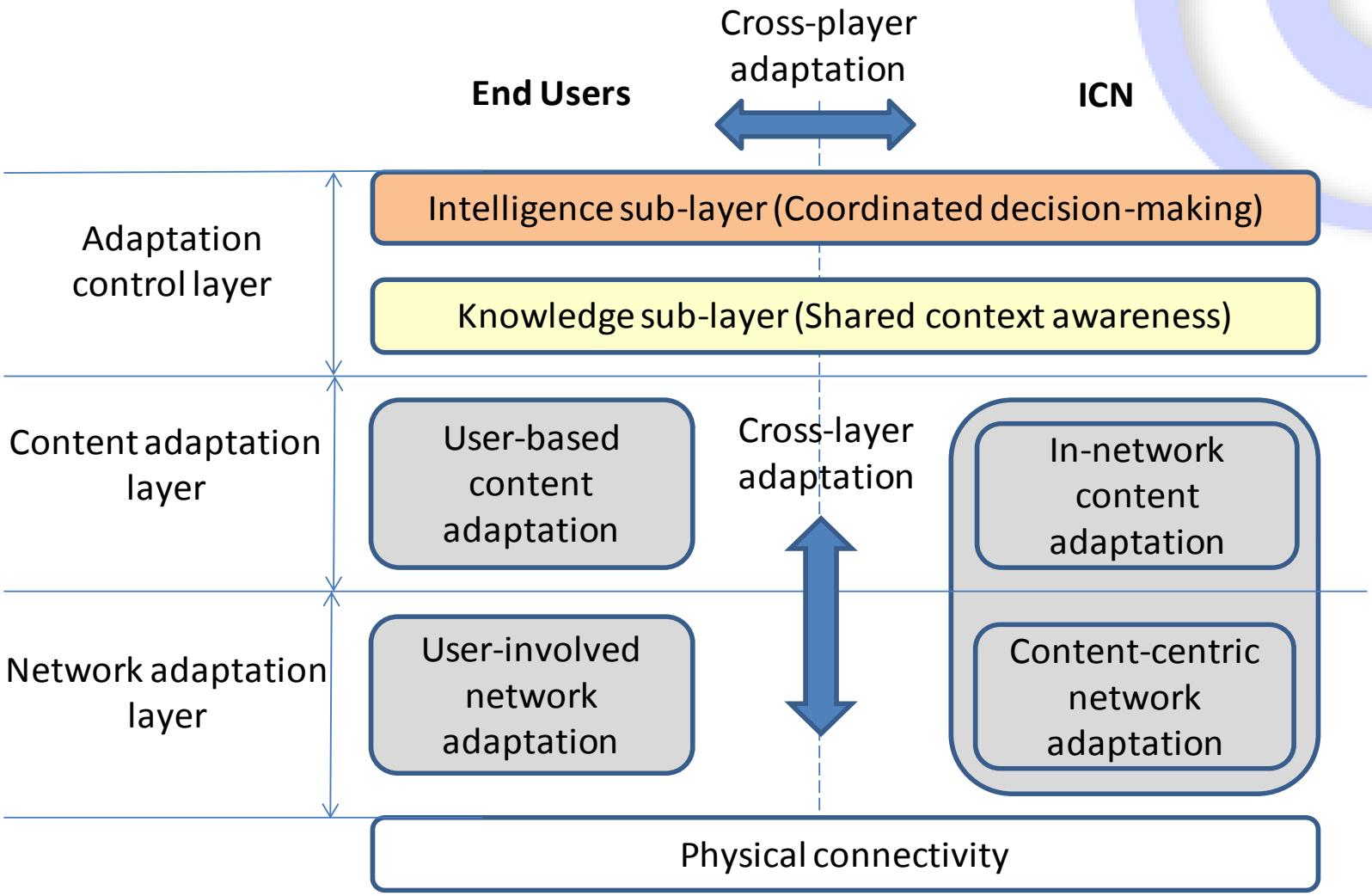


Application Scenario #2: CDN-like Distribution

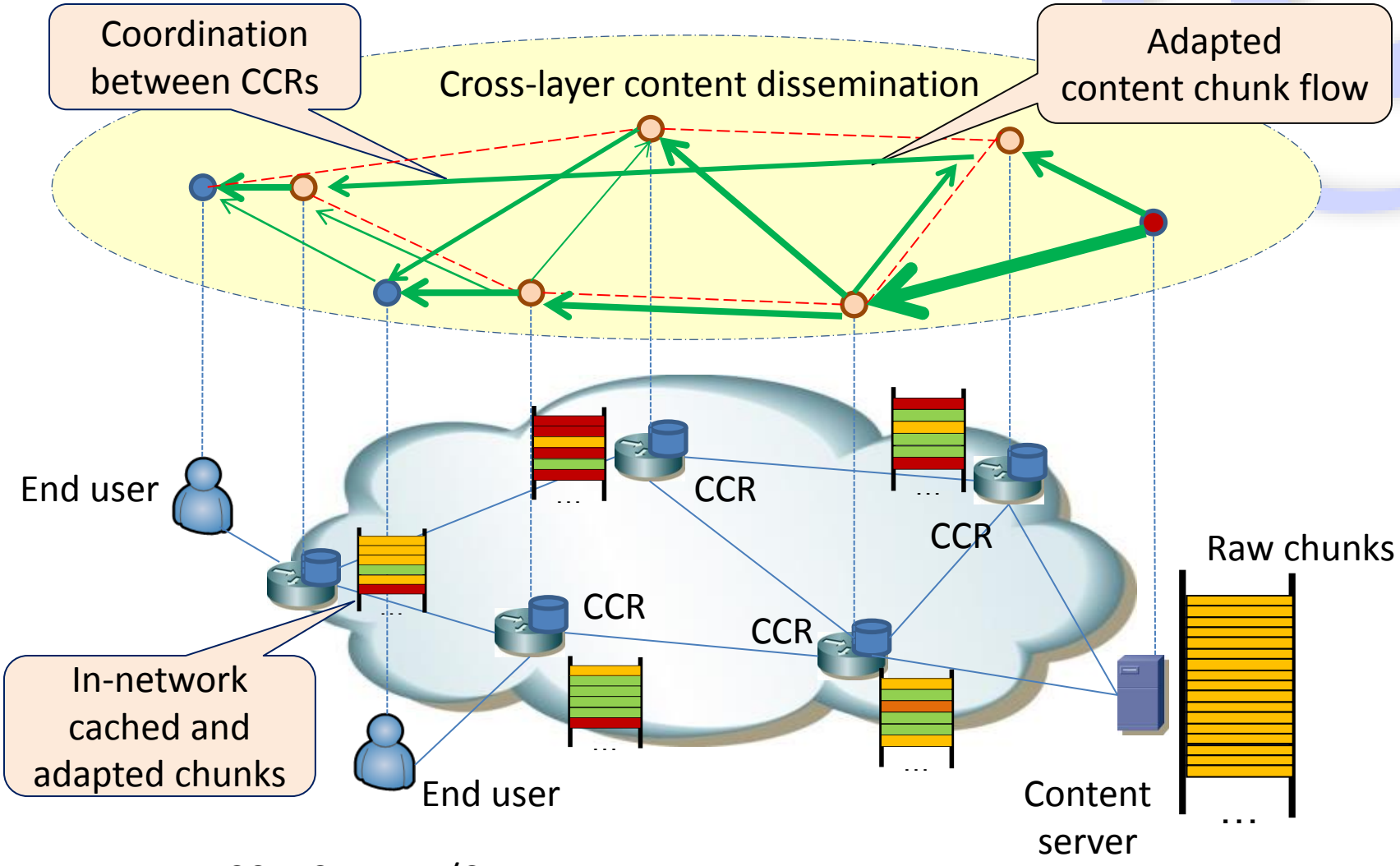
- On-time delivery of content on Internet-scale
- Context-aware in-network content manipulation/adaptation under uncertainties
  - On/off-path content caching / adaptation problem
  - Context-aware content traffic offloading
- Mobile CDN (mCDN) with content-aware mobile network components
  - Base stations (eNodeBs) in particular smallcells
  - Smart gateways
  - Centralised / distributed data centres



CONCERT Framework



CONCERT Ecosystem



CCR=Context-/Content-aware Router

Project Consortium

Project Commencement: **1st January 2014**

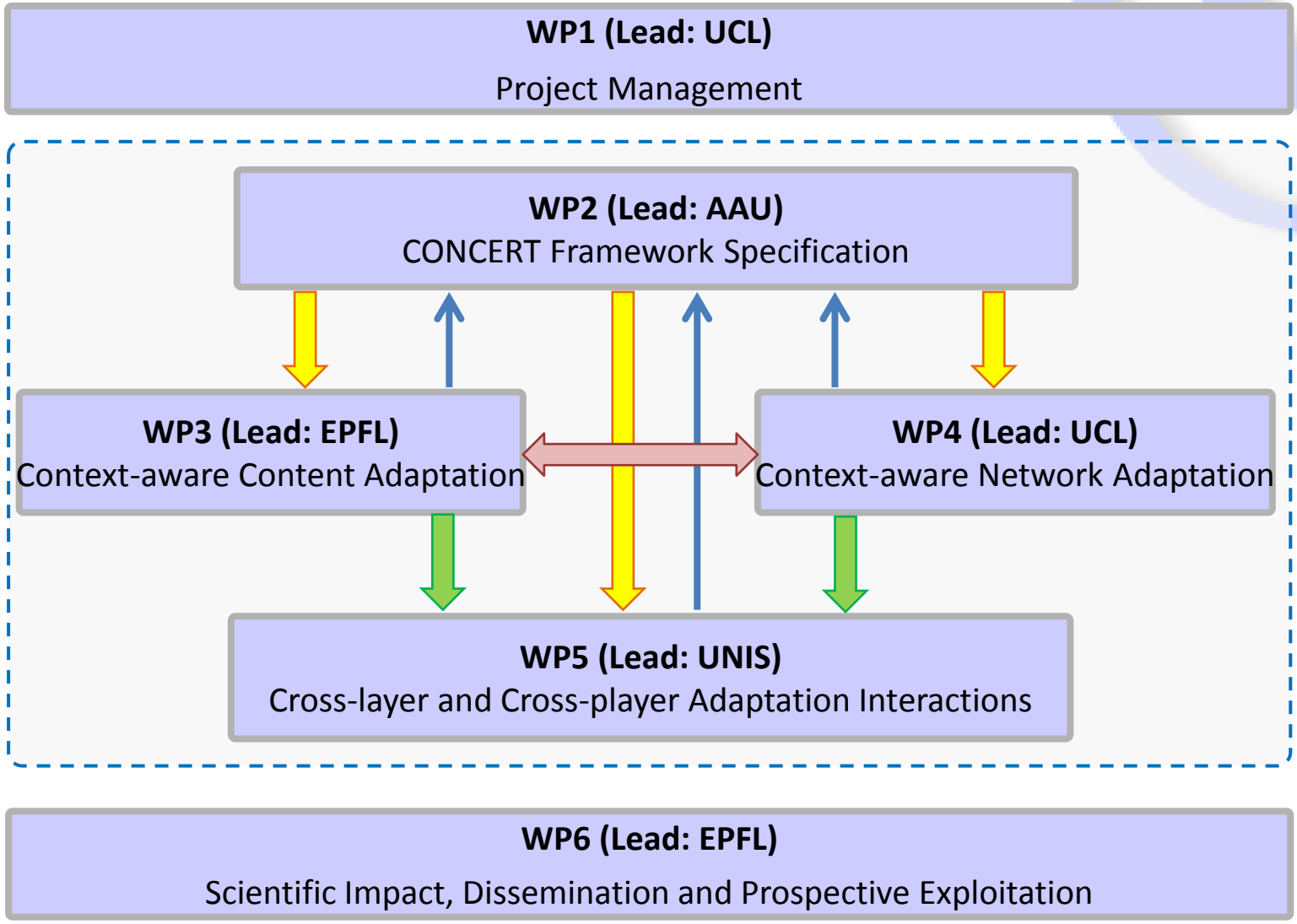
Project Duration: **3 years**

Partners	Country	Sponsor
Project Coordinator University College London (UCL) • George Pavlou, Wei Koong Chai	UK	EPSRC
University of Surrey (UniS) • Ning Wang, George Kamel	UK	EPSRC
AAU Klagenfurt (AAU) • Hermann Hellwagner, Christian Kreuzberger, Daniel Posch	Austria	FWF
École Polytechnique Fédérale de Lausanne (EPFL) • Pascal Frossard, Laura Toni	Switzerland	FNSNF

Partners' Background

- UCL:
  - UniS
    - AAU:
      - EPFL:
        - Image coding and communications
        - Network coding for video streaming
        - Adaptive multimedia streaming
        - Distributed content delivery systems

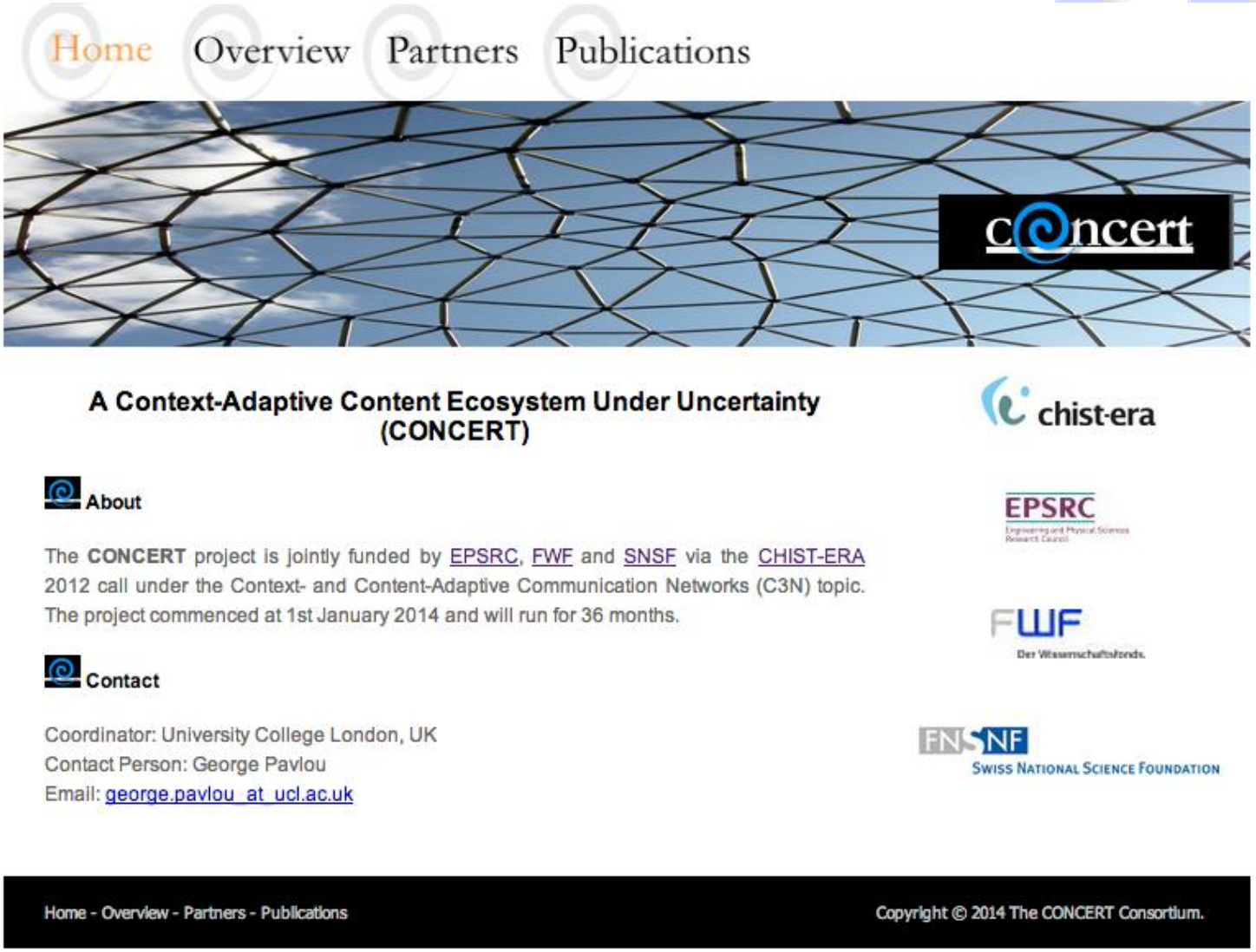
CONCERT Organization



Workpackages and Tasks

- ***WP1: Project Management***
  - T1.1: Management of the Consortium
  - T1.2: Communication and Reporting
- ***WP2: CONCERT Framework Specification***
  - T2.1: Application Scenarios
  - T2.2: Models, Representations and Interactions
  - T2.3: Decision-making and Learning Methodologies
  - T2.4 Overall Architecture and Framework
- ***WP3: Context-aware Content Adaptation***
  - T3.1: Context for Content Adaptation
  - T3.2: Decision-making and Learning Algorithms for Content Adaptation
  - T3.3 Validation and Performance Evaluation
- ***WP4: Context-aware Network Adaptation***
  - T4.1: Context for Network Adaptation
  - T4.2: Decision-making and Learning Algorithms for Network Adaptation
  - T4.3 Validation and Performance Evaluation
- ***WP5: Cross-layer and Cross-player Adaptation Interactions***
  - T5.1: Vertical Cross-layer Adaptation Interactions
  - T5.2: Horizontal Cross-player Adaptation Interactions
  - T5.3: Validation and Performance Evaluation
- ***WP6: Scientific Impact, Dissemination, Potential Exploitation***
  - T6.1: Scientific Impact and Dissemination
  - T6.2: Potential Exploitation of Results

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Thank you

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