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CS-Colloquium

Content centrality as central paradigm in computer networking

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Abstract

The optimisation of content delivery over the Internet has been a research interest for some time and has resulted in Content Delivery Network (CDN) research. This initial work focused on how content can be actively placed closer to the actual user in order to reduce access times and latency. While this research has resulted in successful products and services (e.g., AKAMAI) it only deals with one aspect of content delivery; others such as addressing, host mobility, resilience, etc. are not covered. Hence the concept of Content Networks (CN) has extended CDN research in order to also comprise such other aspects.

One central element of this research is the recognition that users are ultimately interested in the content (or a piece of information) and not any specific copy. This resulted in research on content addressing that allows general content access, i.e., the goal is retrieving content (or information) rather than routing of packets between end hosts. This is called Content-Centric respectively Information-Centric Networking (CCN/ICN). A further aspect is the actual delivery of content where at present, once a delivery is requested, it will be executed using one specific delivery channel and his the Quality of Experience (QoE) can be assured.

In this presentation we are looking at the background and motivation of Content Networking. Subsequently the concepts of CCN/ICN are looked at more closely including CCN/ICN addressing, but also more controversial topics such as the advantages and disadvantages of CCN caching. Further, how the concept of Quality of Experience (QoE) can be integrated within content networks is being looked at. Then JUNO is presented as an example of a content-centric middleware that allows to incrementally introduce content-centric principles into a networked system. The presentation concludes with a look ahead on further research challenges in Content Networking.

Bio

Dr. Andreas Mauthe is Reader in Networked Systems at the School of Computing and Communications (SCC), Lancaster University, UK. His research focus is in two areas



within the networking and systems domain, i.e. Network Management, and Multimedia Systems. In the Network Management domain the main aspects of his research are resilience mechanisms for a better threat detection and protection of networks and distributed systems (such as Cloud environments), and Autonomic Network Management. In the area of Multimedia Systems his current research focus is on Quality of Experience (QoE) and the Delivery and Information Centric Networking. He has (co-)authored more than 80 peer-reviewed papers published in international journals, conferences and workshops. He is also author of a textbook on Professional Content Management Systems. Andreas worked in industry for more than four years in various management and research positions where amongst others he was heading a development team of 28 software engineers, and was also responsible for product development and UK market strategies. He is associated editor of the Multimedia-Systems Journal, has been member of more than 50 programme committees of renowned international workshops and conferences, and has been serving as programme and general chair of a number of significant events . Further, Andreas has been reviewer and expert advisor on various national and international research programmes for the European Commission, and different funding bodies, research councils and government agencies.

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