The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied research. It shares new techniques and concepts, analyses and tutorials, and learnings from experiments and physical and simulated test beds. It also discusses the implications of the latest research results for policy and regulation, legal frameworks, and the economy and society. This publication builds bridges between disciplines, connects theory with application, and stimulates international dialogue. Its interdisciplinary approach reflects ITU's comprehensive field of interest and explores the convergence of ICT with other disciplines. The ITU Journal welcomes submissions at any time, on any topic within its scope.

Special issue on

Integrated and autonomous network management and control for 6G time-critical applications

Call for papers

The current advent of 5G and the beginning of its evolution beyond 5G (B5G) toward 6G development have evidenced a growing integration between the wireless segment and the access/metro/core network portions, in an unprecedented effort to provide true end-to-end services to a diverse set of vertical applications, many of which are based on the Internet of Things (IoT) concept. In line with this vision, communications and computation have become more entangled and computing power more distributed, from remote cloud datacenters down to micro-datacenters in the edge. Cloud-native applications based on micro-services, Mobile Edge Computing (MEC), Network Functions Virtualization (NFV) and Software Defined Networking (SDN) are the architectural and technological paradigms that support this evolution, along with the increased presence of Artificial Intelligence/Machine Learning (AI/ML) techniques.

Both the Data Plane and the Management and Control Plane of the network are profoundly affected by this integration and technological scenario. Automated service decomposition and orchestration, along with "self-driving" networks, possibly empowered by analytics and AI/ML, will be of paramount importance. Moreover, as an evolution of today's IoT deployments, the next generation hyperconnected B5G environment will see machines as main users. The development of a more powerful, efficient and dynamic wireless segment (with increased system capacity, ambient backscattering and dynamic spectrum management, among others) will pose further challenges to network control, management and orchestration.

These characteristics will be particularly evident in the Industrial IoT environment, where very stringent Key Performance Indicators (KPIs) will be pursued regarding, among others, short response times (down to the sub-millisecond time scale) of control actions that need to adapt to very fast system dynamics. Fast scalability (without neglecting energy-efficiency) in the allocation of resources will also be needed, driving management and control planes closer in terms of time scales, towards a possible tighter integration.

Suggested topics (but not limited to):

New architectures for network management and control	• Convergence toward integration of management and control • Advanced management and control architectural paradigms capable of facing the challenges of reduced response times • Distributed and hierarchical integrated management and control paradigms • 6G network scenarios for integrated and autonomous network management and control • Network control and management loops interaction vs. integration
Network reliability, fast scalability, reconfigurability and energy efficiency for time-critical applications	• Advanced model-based and AI/ML-based control techniques • ML algorithms for fast dynamic resource allocation • Fast scalability of network slices • Control/management paradigms with energy-performance trade-off • Feasibility and challenges for sub-millisecond network control and management • Management and control techniques for reliable and highly available services • 6G time-critical applications and verticals
Use cases and enabling technologies	• Use cases and requirements for real time and near-real time network control and management • Case studies and use cases in Industrial IoT applications with tight response times • Enabling technologies for operational tasks (monitoring, measurement acquisition, policy adaptation, actuation) • Strategies for the allocation of computational tasks among micro-datacenters in the edge and datacenters in the cloud

Additional information

Please visit the ITU Journal website at https://www.itu.int/en/journal/j-fet/Pages/default.aspx. Inquiries should be addressed to Alessia Magliarditi at journal@itu.int.

Keywords

Deadlines extended

Paper submission: 11 July 2022
Paper acceptance notification: 20 September 2022
Camera-ready paper submission: 20 October 2022

Paper submission

This special issue calls for original scientific papers. Submitted papers should not be under consideration for publication elsewhere. Submissions must be made electronically using EDAS: Editor's Assistant at https://edas.info/N28781. Templates and guidelines can be found at https://www.itu.int/en/journal/j-fet/Pages/submission-guidelines.aspx.

Publication

As soon as they get accepted, papers will be continuously published on the ITU digital library. They will then be bundled into the special issue digital publication.

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