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Edge Services

IEEE Future NETWORKS

An IEEE Future Networks Technology Roadmap
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Table of Contents

List of Tables

List of Figures

ABSTRACT

This third edition (2023) continues to reflect the Edge service roadmap and journey with evolving key drivers and developments. It replaces the two earlier versions.

5G deployments have reached critical markets and are fast evolving towards 6G promising higher performance and near sub-millisecond latency. Higher automation in use cases fueled by AI (e.g. like ChatGPT) is expected to be the core of future applications and services.

The service providers have started re-focusing on use cases that can leverage the new and improved capabilities for better average revenue per unit (ARPU) for both consumers and enterprises.

Some of the edge relevant Service oriented use cases are based on key constraints (low latency, high throughput, low jitter)

- Industrial Internet of Things (IIoT) Industry 4.0
- Vehicle to anything - V2X (autonomous vehicle / intelligent transportation / traveling edge)
- Telehealth / telemedicine / remote diagnostics
- Content delivery (with caching, real time, rich media internet applications)
- Ad hoc, temporary or on as needed mission specific edge services (emergency, ad hoc major events, DoD combat mission, and more)
- Enabling sustainable development edge applications.

Key elements of the edge-inspired infrastructure to support such services may be noted as follows:

- Enabling edge with AIML, e.g., OpenAI / *ChatGPT
- Radio-based Multi-Access Edge (MEC) to provide different services
- Real-time / near real time enabled radio control, management, and xApps based on O-RAN
- Constraint-based edge infrastructure to optimize power, form factor, and updates to NFV-SDN with the IoT middleware standards OneM2M from ETSI to cover IoT applications
- The focus on data privacy, security, data “localization and analytics”
- Intelligent edge microservices and applications deployed using newer infrastructure components from Semiconductor innovations e.g. DPU, IPU, etc.
- MEC and 5G integration to support location-based edge platform API adaption
- Small cells and private B5G networks

We classify platform aspects with Edge Platform Framework (EPF) and Services with Edge Service Framework (ESF) updates and overall aspects as Edge Service and Platform Framework (ES&PF) for an integrated view.

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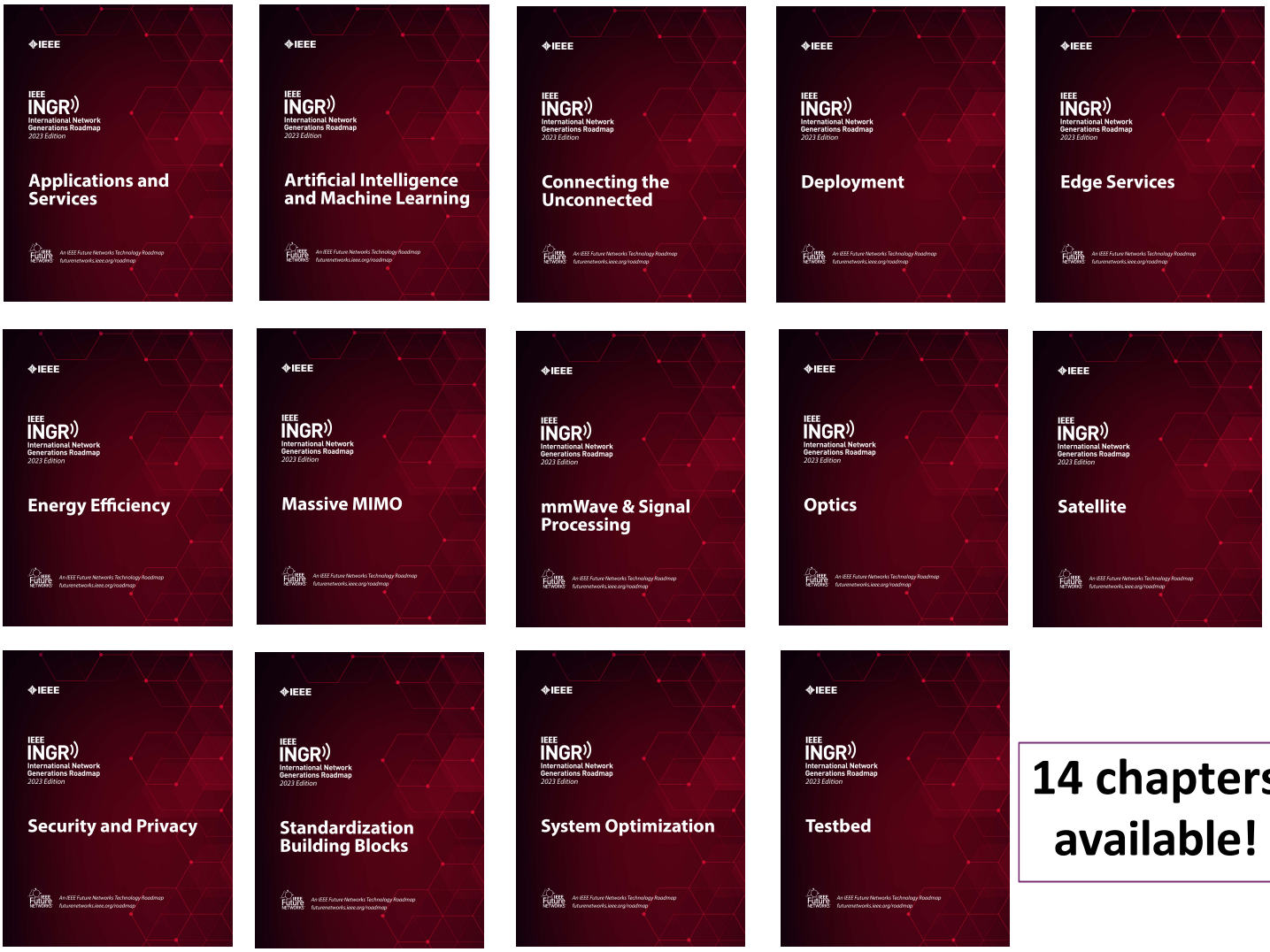

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