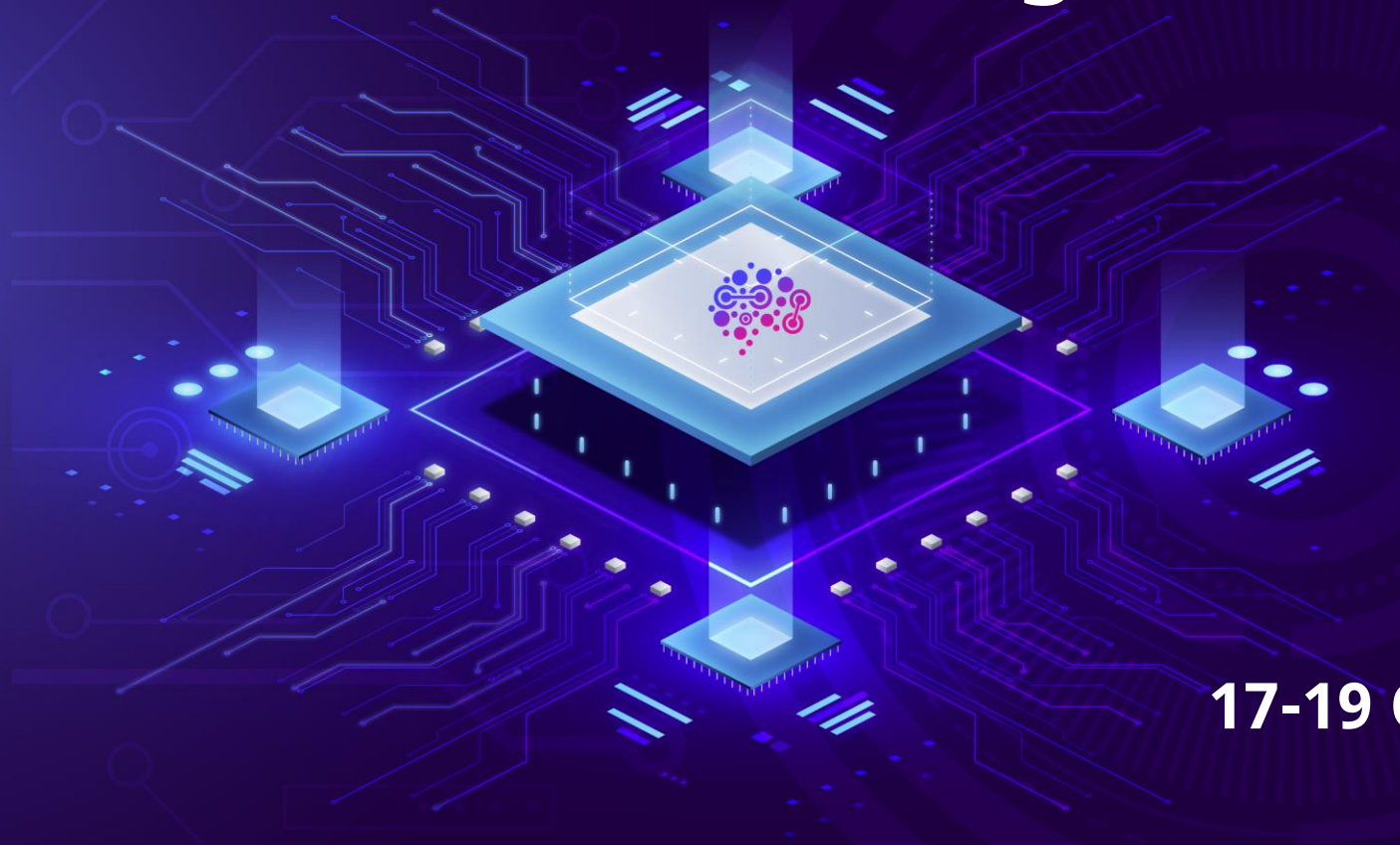
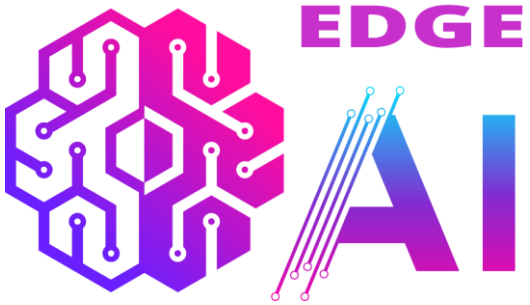
European Conference on EDGE AI Technologies and Applications - EEAI



Advancing emerging edge AI technologies and driving next generation intelligent applications.

17-19 October 2023, Athens, Greece

European Conference on EDGE AI Technologies and Applications - EEAI



EdgeAI

Edge AI Technologies for Optimised Performance Embedded Processing

Ovidiu Vermesan, SINTEF, Norway

17-19 October 2023 Athens, Greece

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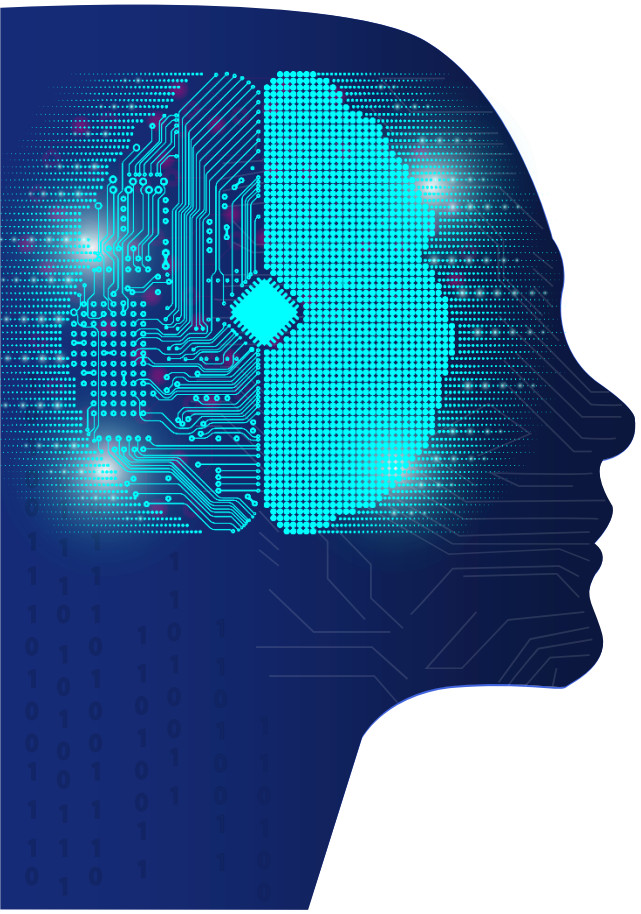
Presentation Outline



- Overview
- State-of-the-art
- Highlights

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Project Overview

EdgeAI (Edge AI Technologies for Optimised Performance Embedded Processing) develops **new electronic components and systems,** processing architectures, connectivity, software, algorithms, and middleware through the combination of **microelectronics, edge AI, embedded systems, and edge computing.**

EDGEAI

Start Dec **2022**	End Dec **2025**
Duration **37M**	Budget **35.4M€**
Partners **49**	Countries **11**

Accelerate edge AI HW/SW design, innovation and development.

Objectives

Objective 1
Develop secure AI-based edge platforms for end-to-end hardware/software solutions addressing the AI design stack and middleware.

Objective 2
Provide scalable edge AI-based energy-efficient techniques, methods and frameworks supporting different OSs and hardware platforms.

Objective 3
Advance multi core SoC and SoM AI-based designs with embedded hybrid architectures, connectivity and IIoT devices for industrial environments.

Objective 4
Integration of scalable and modular AI Co-design: hardware/software, algorithms, topologies into novel AI open architecture platforms.

Objective 5
Implementation of reconfigurable AI-based architectures for increasing the re-use, updatability, upgradability and service life of AI.

Objective 6
Provide trustworthy and explainable edge-AI by design solutions with real-time operation capabilities and dynamic online learning.

Application Areas

EdgeAI developments implement applications across the edge continuum (micro, deep, meta-edge).

https://www.edge-ai-tech.eu

https://www.linkedin.com/company/edgeaiproject/

Ovidiu.Vermesan@sintef.no (Coordinator)

Project Partners

SINTEF, Infineon, ams OSRAM, SoftwareCUBE, TU/e, imec, NXP, GNT, NEURO Controls, COGNITION FACTORY, IMST, Universität zu Lübeck, netcompany intrasoft, life.augmented, VRANKEN POMMERY, TECHNEXT, cea, GRENOBLE INP UGA, Université de Reims Champagne Ardenne, cnrs, Université Polytechnique Hauts-de-France, Χαροκοπειο Πανεπιστημιο Harokopio University, scm group, HTS High Technology Systems, Intelligent Machines IoT & Cyber Physical Systems DeepSensing S.R.L., Xtremion, Università degli Studi di Cagliari, Alma Mater Studiorum Università di Bologna, Università degli Studi di Milano, Elektronikas un datorzinātnu institūts Institute of Electronics and Computer Science, signify, Technolution, almende, TU/e, Fredrikstad energi, NxtEnergy, PROLUX, nxtech, ITML, CONVERGENCE

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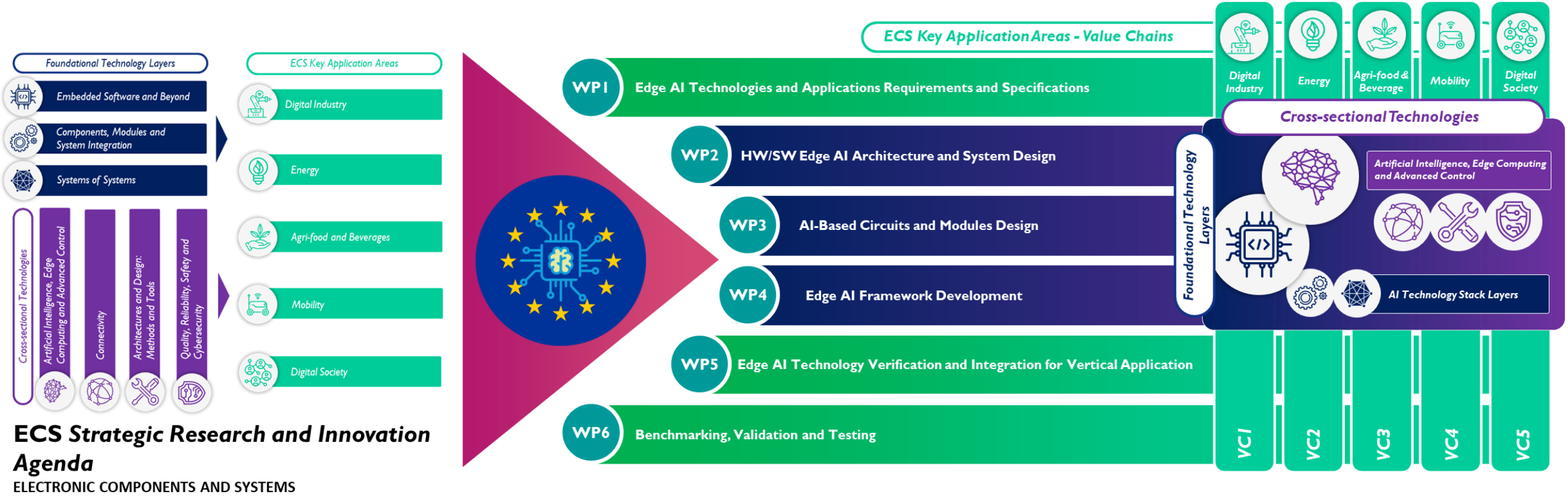
Alignment with SRIA



ECS *Strategic Research and Innovation Agenda*

ELECTRONIC COMPONENTS AND SYSTEMS

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Technology Stack and Technology Blocks

AI Toolchains
Programming - AI engineering tools
AI platforms and automated tools

AI Frameworks
AI Software algorithms
AI Middleware

Automated transfer-learning
Meta-learning
Real-time learning
Federated learning

Edge AI Training

Training architecture
Training acceleration
Training optimisation

Trustworthy Explainable Interpretable Edge AI by Design

AI Model
Design
Compression
Optimisation

Edge AI Inference

HW/SW Acceleration
Benchmarking

EDGE AI

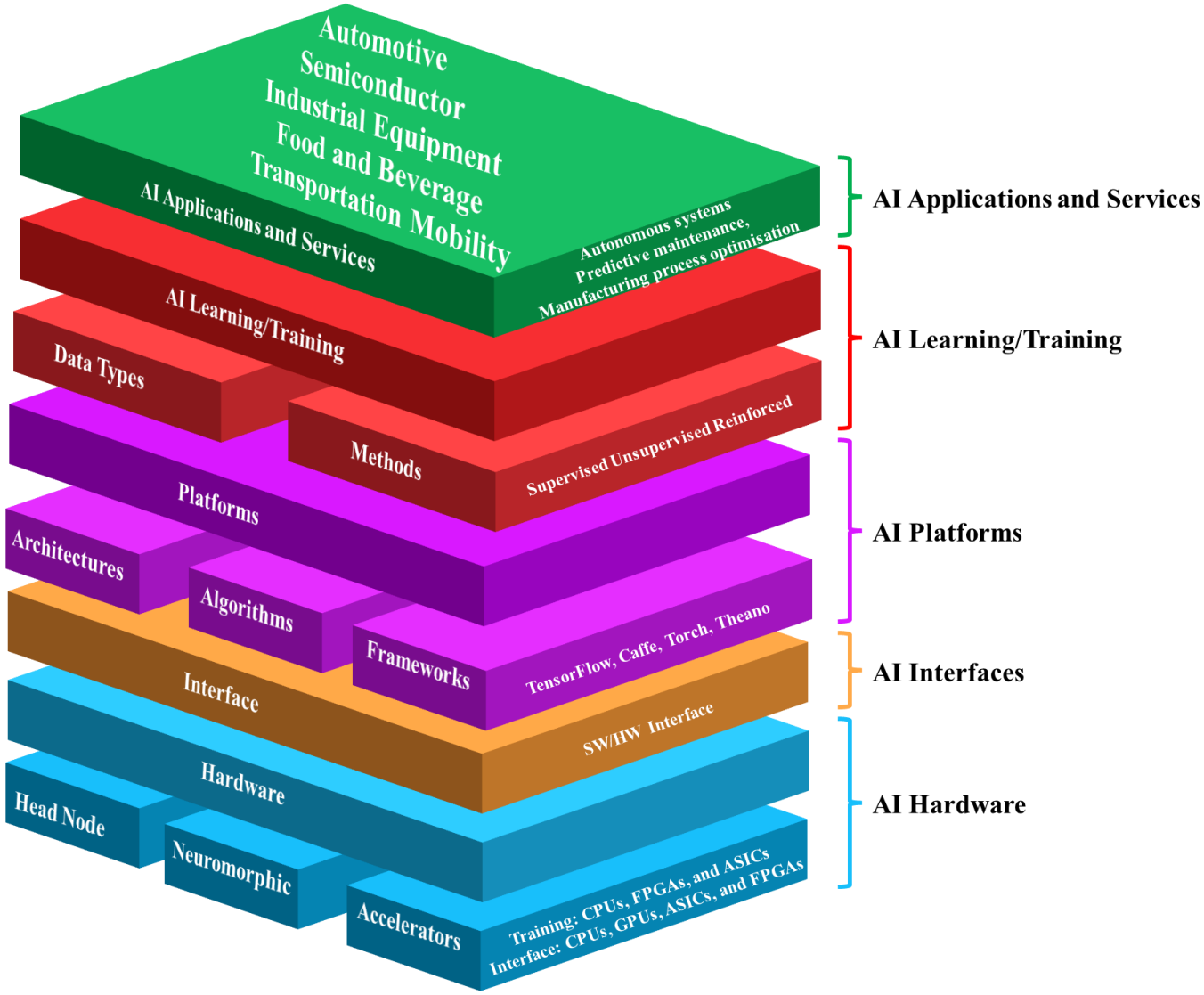
Virtualization - at firmware, OSs and middleware layer

Energy efficiency and improved processing capabilities for edge AI

Edge AI HW/SW Co-Design

New processor architectures
Accelerators
VPU, GPU, TPU, Neuromorphic

Hybrid and scalable architectures
SoC and SoM
Memory management



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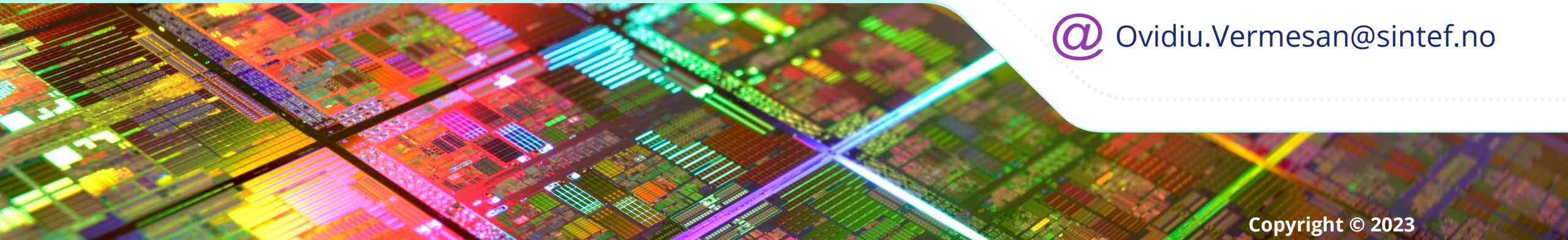
EDGE AI

Thank You

For your attention



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