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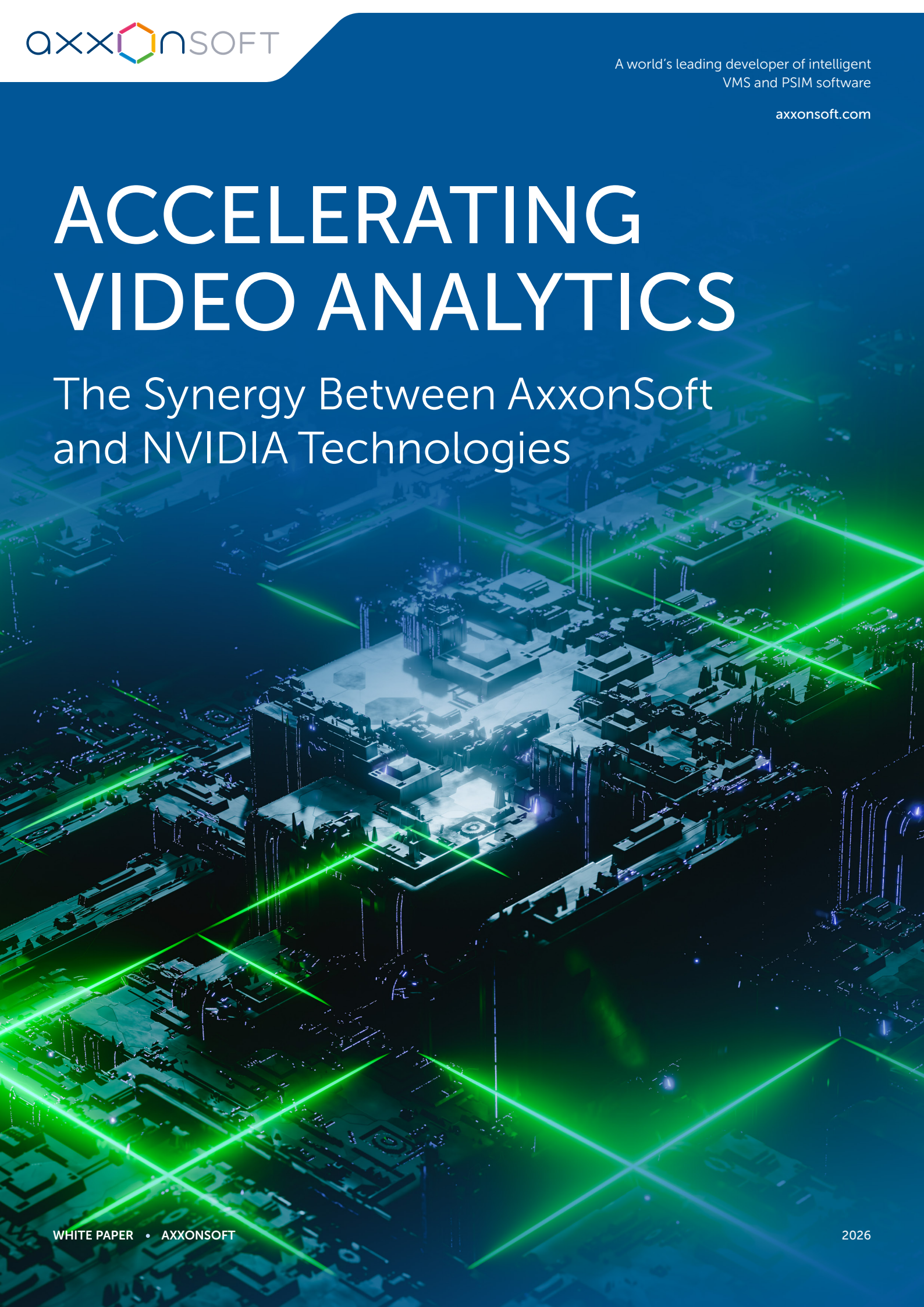
ACCELERATING VIDEO ANALYTICS

The Synergy Between AxxonSoft and NVIDIA Technologies



WHITE PAPER • AXXONSOFT

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Abstract

This whitepaper highlights how AxxonSoft's video analytics platform leverages NVIDIA's advanced AI technology. It explores how real-time video processing, scalability, and performance across diverse sectors such as security, retail, and smart cities are enhanced by combining AxxonSoft's AI-powered video analytics platform with NVIDIA's high-performance GPUs. By implementing this solution, businesses can achieve faster, more accurate and scalable analytics. The paper also includes performance benchmarks and explores real-world use cases, demonstrating the transformative potential of this powerful partnership for video analytics and intelligent decision-making.

CONTENTS

1. Introduction

In the ever-evolving landscape of video analytics, the ability to process massive volumes of video data in real time has become crucial for a wide range of industries. Whether for enhancing safety, optimizing business operations, or driving innovation in smart cities, organizations are looking for solutions that deliver intelligence and actionable insights from their video feeds.

AxxonSoft, a global leader in video management software and intelligent video analytics, has continuously pushed the boundaries of what is possible in the industry. By integrating cutting-edge AI algorithms, AxxonSoft's Axxon One platform provides users with a robust tool set for video management, anomaly detection, license plate recognition, object tracking, and more. These capabilities allow businesses to take full advantage of the vast amounts of video data they generate, turning raw footage into valuable insights.

At the heart of AxxonSoft's success is its collaboration with NVIDIA, a pioneer in GPU technology. NVIDIA's powerful GPUs, including the A100 and H100, bring unprecedented computational power to AI and machine learning applications, enabling rapid processing of complex tasks like video analytics. The combination of AxxonSoft's innovative software and NVIDIA's high-performance hardware ensures that organizations can leverage scalable, real-time video analytics, even with high-resolution, high-density video streams.

1.1 AxxonSoft Overview

AxxonSoft is a leader in video management software and intelligent video analytics. Their Axxon One software platform provides scalable and AI-powered solutions that are deployed worldwide. AxxonSoft enables businesses to analyze video footage for real-time insights and more efficient investigations, improving decision-making and operational efficiency.

1.2 NVIDIA Overview

NVIDIA is a global leader in AI computing, known for its groundbreaking advancements in GPU technologies. The company's powerful GPUs are optimized for demanding workloads such as machine learning, deep learning, and video analytics. NVIDIA's hardware accelerates the speed and accuracy of AI models, enabling real-time data processing and complex computations. In addition to hardware, NVIDIA offers software solutions like CUDA SDK, Metropolis, and TensorRT, which optimize performance and streamline AI workflows, making NVIDIA GPUs the ideal platform for industries requiring high-performance video analytics.

2. NVIDIA GPU Technology

NVIDIA's GPUs, equipped with advanced features like Tensor Cores and CUDA, are designed to accelerate AI workloads. These powerful processors enable real-time processing of high-resolution video streams, applying deep learning models for tasks such as object classification and behavior analysis.

2.1 Integration with AxxonSoft's Video Analytics

AxxonSoft's video analytics software is optimized for NVIDIA GPUs, enabling fast and accurate AI inferencing. By using GPUs to process video streams, AxxonSoft significantly improves the performance of its analytics, allowing businesses to process multiple video feeds simultaneously at a lower cost while maintaining high levels of accuracy.

3. Integration of AxxonSoft and NVIDIA Technologies

AxxonSoft's adoption of NVIDIAs AI stack delivers a cutting-edge solution for video analytics, leveraging the best of software and hardware innovation to meet the growing demands of modern industries. This section explores the synergy between AxxonSoft's AI-driven video analytics platform and NVIDIA's GPU and AI software, detailing how the integration delivers exceptional performance, scalability, and flexibility for complex video analysis tasks.

3.1 AI Video Analytics Enhanced by GPUs

With NVIDIA GPUs, AxxonSoft's video analytics software can quickly analyze video feeds, applying sophisticated AI models to identify and track objects, detect anomalies, and generate actionable insights in real time. The GPU's parallel processing capabilities ensure that even large-scale video systems run efficiently.

3.2 Scalability and Flexibility

The ability to scale across multiple GPUs allows businesses to deploy large systems without sacrificing performance. AxxonSoft's platform, when combined with NVIDIA's powerful hardware, ensures that businesses can expand their systems and support more cameras and more complex analytics with ease.

4. Performance and Benchmarks

4.1 Testing Methodology

Performance tests were conducted to evaluate how AxxonSoft's software benefits from NVIDIA GPUs compared to CPU-based configurations when running AI video analytics (neural network analytics). These tests aimed to measure the increase in VMS server performance and assess the software's integration with NVIDIA hardware. Key focus areas included processing efficiency, system stability, and the ability to handle multiple video streams with analytics under conditions closely resembling real-world scenarios. The results highlight the advantages of leveraging GPU acceleration for scalable and efficient video analytics.

4.2 Results

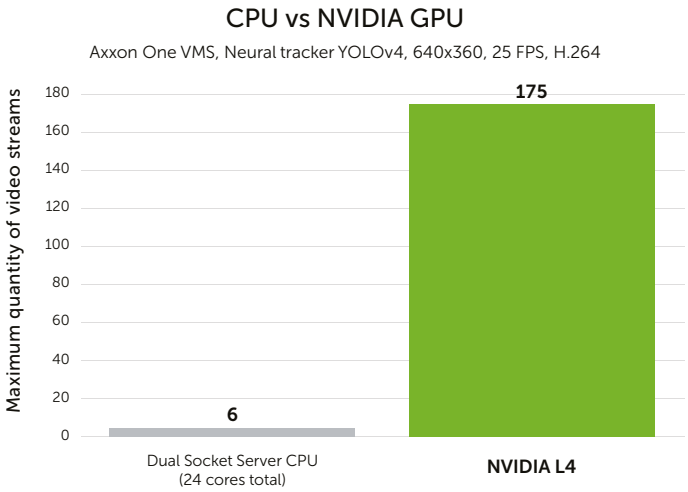

Chart 1: Comparison of the maximum number of video streams (640x360) simultaneously processed on CPU-based and NVIDIA L4 server (Data center) GPU–based configurations when running a neural tracker (pedestrian and vehicle detection and tracking)

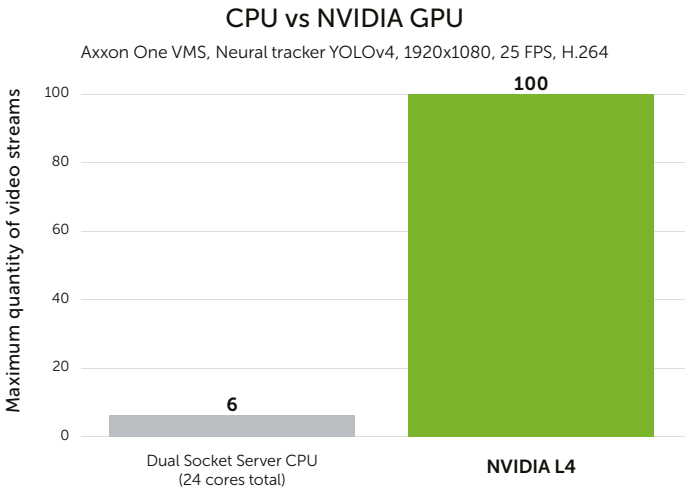

Chart 2: Comparison of the maximum number of video streams (1920x1080) simultaneously processed on CPU-based and NVIDIA L4 server (Data center) GPU–based configurations when running a neural tracker (pedestrian and vehicle detection and tracking)

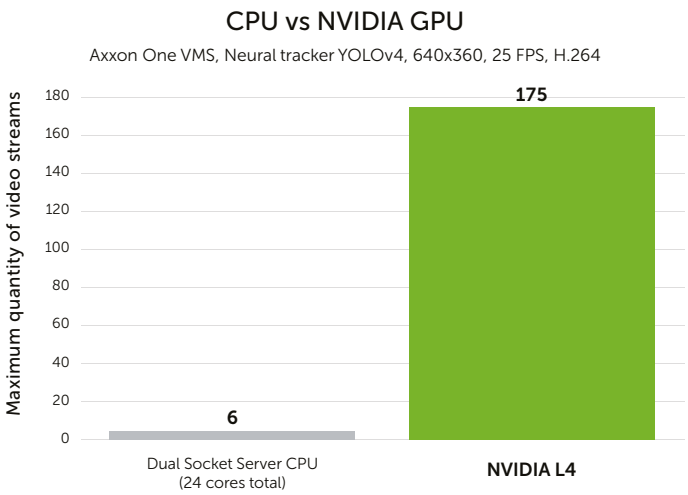

Chart 3: Comparison of the maximum number of video streams (640x360) simultaneously processed on CPU-based and NVIDIA RTX A1000 professional GPU–based configurations when running a neural tracker (pedestrian and vehicle detection and tracking)

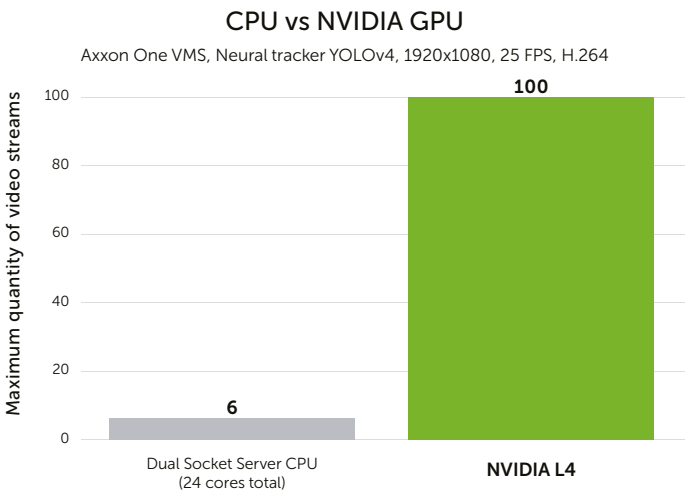

Chart 4: Comparison of the maximum number of video streams (1920x1080) simultaneously processed on CPU-based and NVIDIA RTX A1000 professional GPU–based configurations when running a neural tracker (pedestrian and vehicle detection and tracking)

The results show significant improvements in video analytics performance, including faster processing times and reduced inference delays.

NVIDIA GPUs enabled AxxonSoft to process several times more video streams compared to traditional CPU-only configurations, offering a more cost-effective solution for video analytics at scale:

At 640x360 video stream resolution with neural analytics, the NVIDIA L4 server (Data center) GPU can handle up to 29.1 times more video streams compared to a Dual Socket Intel Xeon CPU configuration (24 cores total).

At 1920x1080 resolution with neural analytics, the NVIDIA L4 server (Data center) GPU can handle up to 16.6 times more video streams compared to a Dual Socket Intel Xeon CPU configuration (24 cores total).

At 640x360 video stream with neural analytics, the NVIDIA RTX A1000 professional GPU can handle up to 8.3 times more video streams compared to a Dual Socket Intel Xeon CPU configuration (24 cores total).

At 1920x1080 resolution with neural analytics, the NVIDIA RTX A1000 professional GPU can handle up to 7.5 times more video streams compared to a Dual Socket Intel Xeon CPU configuration (24 cores total).

5. Synergy with NVIDIA Metropolis

AxxonSoft's video analytics platform is optimized for NVIDIA GPUs and accelerated by the NVIDIA Metropolis platform for vision AI applications. By leveraging NVIDIA DeepStream, a core component of Metropolis, AxxonSoft achieves high-performance video analytics through TensorRT and CUDA optimizations. This enables efficient processing of dozens or even hundreds of concurrent video streams on a single server, ensuring both scalability and cost-effectiveness.

NVIDIA Metropolis also simplifies development by providing ready-to-use pipelines for decoding, tracking, and analytics, allowing AxxonSoft's engineers to focus on business logic rather than low-level infrastructure. By leveraging the Metropolis platform, AxxonSoft gains access to NVIDIA NGC model repository and the TAO Toolkit, opening opportunities to adopt state-of-the-art AI models for object detection, recognition, and multi-camera tracking.

Beyond performance, the integration brings ecosystem benefits: AxxonSoft's solutions become part of a global ecosystem of enterprise customers and AI developers utilizing NVIDIA technology, seeking advanced video analytics solutions. This synergy strengthens both innovation speed and market reach, ensuring customers benefit from cutting-edge, scalable, and production-ready AI video solutions.

6. Use Cases

6.1 Smart Cities

By combining AxxonSoft's AI-powered video management platform with NVIDIA GPUs, cities can deploy large systems capable of real-time analytics, such as fire/smoke detection, traffic monitoring, and crowd management, ensuring public safety and better living environment.

6.2 Retail Security

Retailers can benefit from enhanced analytics, such as queue detection, visitor interest heatmapping, and people counting. Real-time and historical data enables smarter decisions on store layout, customer engagement, staff allocation, and security, creating a better shopping experience while ensuring safety.

6.3 Industrial Applications

Industrial environments like factories and warehouses can leverage AI-powered video analytics to monitor operations in real time for advanced predictive maintenance, enhanced workplace safety monitoring and workflow optimization, as well as automated security monitoring.

7. Conclusion

AxxonSoft's adoption of NVIDIA AI is transforming the way businesses leverage video analytics. By combining AxxonSoft's AI-driven video management platform with the power of NVIDIA's GPUs and AI software stack, organizations can achieve faster, more accurate and scalable video analytics, unlocking new possibilities for operational efficiency and security.

CONTACT INFORMATION

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