CASE STUDY

TRANSFORMING CARIBBEAN STREAMING

cablebahamas

technology unleashed

ATEME

CASE STUDY

2016 the beginning – a first step in the OTT world

Cable Bahamas Ltd. (CBL), a leading telecommunications and media company in The Bahamas, has been a pioneer in transforming the digital landscape of the region since its inception in 1995.

With approximately 65,000 TV subscribers, CBL embarked on a transformative journey starting in 2016 to introduce a "TV Everywhere" system. This initiative aimed to provide subscribers with the ability to access their favorite content anytime, anywhere, across multiple devices.

To achieve this vision, CBL issued a Request for Proposal (RFP) to identify the best technology ecosystem capable of delivering seamless, high-quality OTT (Over-The-Top) services. Ateme, (then Anevia), responded with a tailored solution in collaboration with partners Minerva (service platform), Verimatrix (DRM), and Wisi for transcoding.

The key features of the solution included:

In response to Cable Bahamas's RFP, Ateme (then Anevia) collaborated with its ecosystem partners, including Minerva (service platform), Verimatrix (DRM), and a transcoding platform (Wisi), to deliver a state-of-the-art Over-The-Top (OTT) solution. This solution was designed to address CBL's specific requirements, which included:

- Live Encrypted HLS Streaming: 60 channels delivered at 5Mbps per channel
- Catch-Up TV (CUTV): with a three-day viewing window.
- Shared Copy Network DVR (nDVR): for content recording for up to 30 days
- Streaming peak: Support for 5% of CBL's 60,000 subscribers streaming simultaneously at 3 Mbps.

At the heart of this deployment was Ateme's NEA DVR system with Embedded Distributed Storage (EDS), a cutting-edge solution leveraging Commercial Off-The-Shelf (COTS) hardware from HPE and Dell. This integration of compute and storage functions minimized infrastructure requirements and ensured robust performance.

Advantages of Ateme's NEA DVR System with EDS:

Resiliency
The EDS platform has become a proven solution for video storage, blending high throughput with multi-layered resiliency. Leveraging erasure coding technology with 3:2 redundancy ratio -3 replications written on storage, only 2 required for reading -, the system ensures seamless content streaming by maintaining functionality with any two of three replications.. This design safeguards uninterrupted service, even during complete server failure.

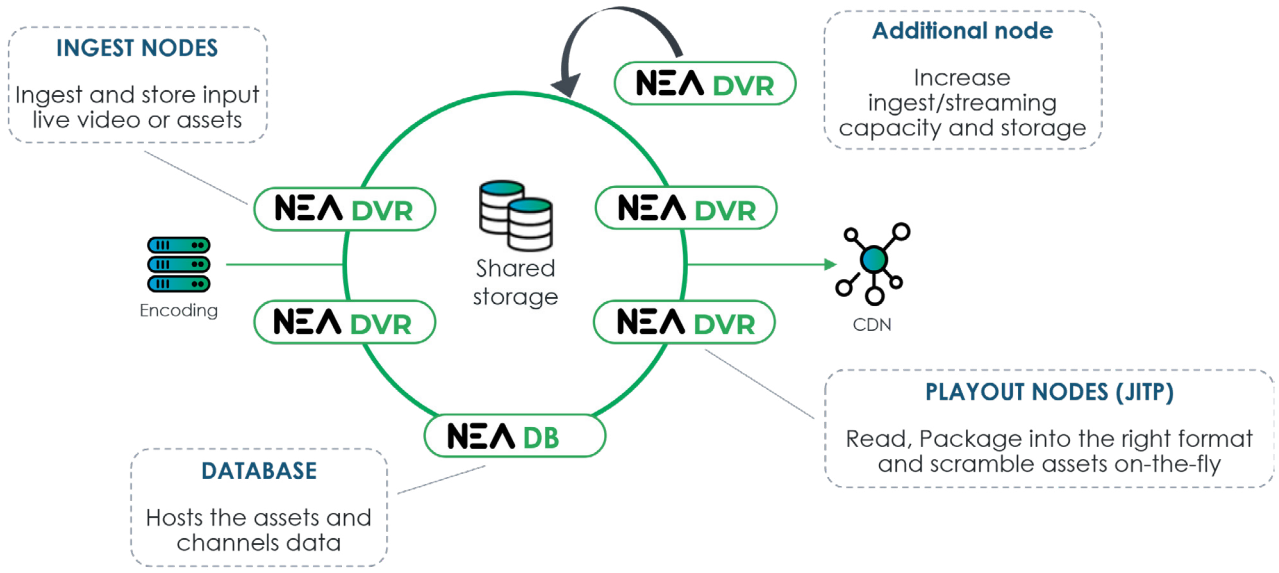
Small Footprint, Big savings
Ateme's all-in-one EDS solution effectively addresses the Caribbean's humid and unpredictable climate by significantly reducing power consumption and HVAC requirements. Unlike traditional setups that require separate racks for compute and storage, this compact design minimizes physical and environmental footprints while maintaining high availability and reliability.

Scalability and Ease of Use
Scaling the EDS system is as simple as adding servers to the cluster. Each new server

contributes additional compute and storage capacity, enhancing ingest and streaming performance without downtime. A single-pane-of-glass management interface simplifies operations, allowing seamless cluster expansion and centralized control.

Reliability
With **erasure coding**, a **redundant architecture**, and the use of COTS **servers**, the EDS platform delivers exceptional performance and reliability. Its robust design ensures high availability, even in the Caribbean's challenging environmental conditions.

Below is a diagram resuming the advantage of the EDS platform



Accurate sizing and scalability were essential for Cable Bahamas to deliver seamless OTT services while addressing both current and anticipated demands. Ateme's NEA DVR EDS solution was meticulously designed to meet the stringent requirements for ingest, storage, and streaming.

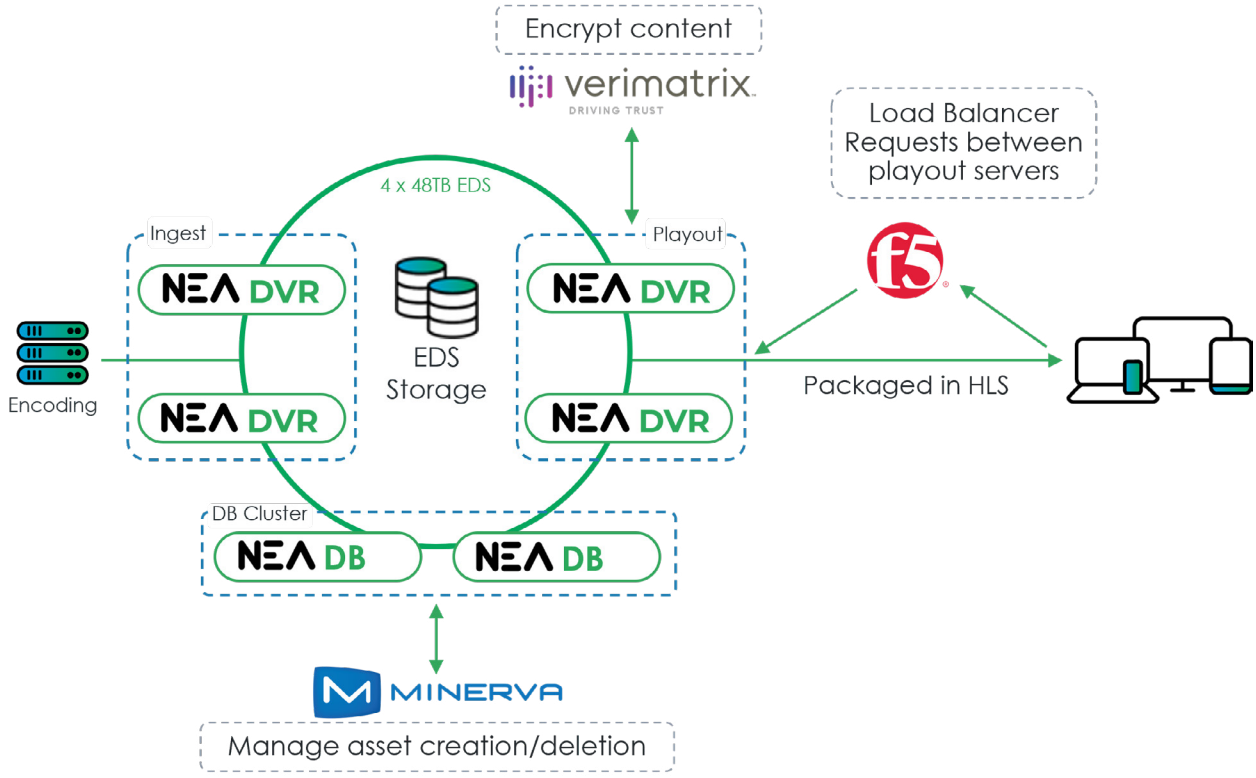
Ingest Requirements
- **Bandwidth:** The system was designed to handle 480 Mbps of ingest bandwidth, based on 60 channels at 8 Mbps per channel.
- **Redundancy:** A 1+1 redundancy configuration was implemented to ensure uninterrupted service in the event of hardware failure.

Storage Requirements
- **Catch-Up TV (CUTV):** Required storage for three days of content, 16 TB
- **Shared Copy nDVR:** Required storage for 30 days of recordings, with a 30% retention rate, totaling 47 TB
- **Total Storage:** Calculated at 63 TB.
- **Implementation:** The NEA DVR EDS solution utilized a cluster of four servers, each with 48 TB of raw storage, resulting in:
  - 192 TB of raw capacity.
  - 126 TB of effective storage after applying erasure coding (3:2), ensuring resiliency and the ability to withstand a complete server failure without service disruption.
  - Sufficient headroom to support projected growth for the next year.

Streaming Requirements

- **Subscriber Base:** Assumed 5% of CBL's 60,000 subscribers would stream content simultaneously.
- **Throughput:** At an average bitrate of 3 Mbps per user, the system required 9 Gbps of streaming capacity.
- **Architecture:** The NEA DVR EDS Playout servers were placed behind a CBL provided load balancer to ensure efficient traffic management and seamless service.
- **Performance:** The platform's benchmarked capacity exceeded the required 9 Gbps, guaranteeing high performance even during peak usage.

High level architecture of the solution with Ecosystem partner



CBL selected the Ateme EDS solution for its:

- **Performance:** Exceptional speed and reliability for video delivery.
- **Minimal Footprint:** Optimized for environments with space and climate constraints.
- **Scalability:** Easy and cost-effective to expan as needs grow.
- **Operability:** Simplified management with a robust, resilient architecture.

By adopting Ateme's EDS solution, CBL set a regional benchmark for OTT services, ensuring a future-ready platform that meets both current and evolving needs.

2019-2020: Scaling up with CDN Expansion

By 2019, to meet customer expectations and maintain its reputation for reliability, CBL prioritized buffer-free playback to ensure a seamless streaming experience for end users.

A Partnership of Trust

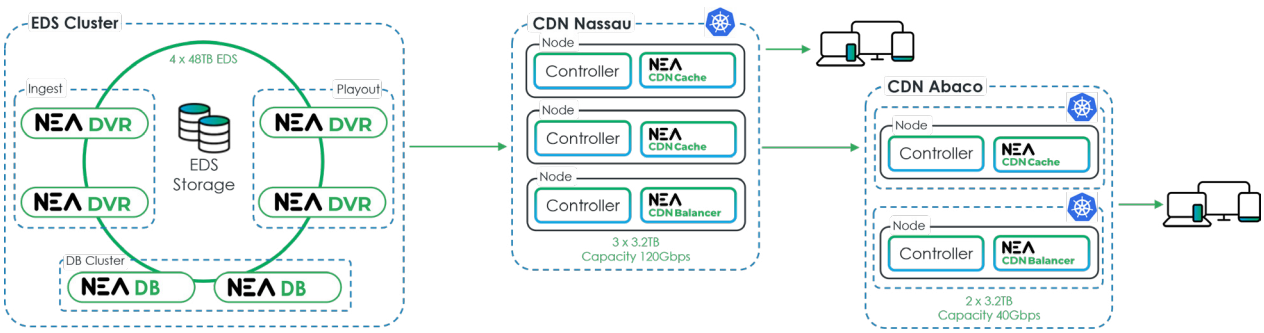
Building on a history of successful collaboration, CBL partnered with Ateme to scale its

streaming capabilities and address the challenges of serving a geographically dispersed population. Ateme proposed its innovative NEA Content Delivery Network (CDN) solution to deliver high-quality content reliably across the islands.

NEA CDN: A Game Changer
Ateme conducted a thorough analysis of CBL's infrastructure and operational needs, introducing the NEA CDN as a distributed caching system optimized for content delivery. Key benefits included:

- **Increased Capacity and Reliability:** The NEA CDN, paired with the NEA DVR, significantly boosted streaming capacity and ensured buffer-free content delivery. By caching content closer to end users, it reduced latency and network congestion.
- **Microservices Architecture:** Built on a modern framework, the NEA CDN offered modularity, easy deployment, and scalability to adapt to CBL's evolving needs.
- **COTS Hardware Integration:** Utilizing Commercial Off-The-Shelf (COTS) servers provided flexibility in hardware selection, streamlining deployment in new locations across the Bahamas.

Streaming Requirements
- **Subscriber Base:** Assumed 50% of CBL's 60,000 subscribers would stream content simultaneously.
- **Throughput:** Required 120 Gbps streaming capacity at an average bitrate of 4 Mbps per user.
- **Architecture:** The NEA CDN replaced CBL's load balancer, offering enhanced traffic management and security features like Geo-localization, protection against DDoS attacks, and anti-piracy measures. The main CDN was deployed on Nassau where 90% of the end users are, and a distributed CDN is deployed on Abaco to support a significant portion of subscribers.
- **Performance:** Delivered high capacity and low response times, exceeding performance requirements..



Reaching Every Island with Ease
The NEA CDN's distributed architecture addressed the Caribbean's unique challenges, ensuring reliable service across islands. Its COTS hardware integration simplified expansion to new locations, making scaling both seamless and cost-effective.

Impact on End Users
By implementing Ateme's NEA CDN solution, CBL transformed its streaming capabili-

ties, meeting the rising demand for seamless, high-quality content. Viewers across the Bahamas enjoyed a localized, uninterrupted streaming experience, regardless of their location.
This collaboration deepened the partnership between CBL and Ateme, underscoring their shared dedication to innovation and customer satisfaction while paving the way for ongoing improvements in CBL's services.

2022 Multi cluster and CDN expansion for dual site redundancy

Following the successful launch of its OTT product, Cable Bahamas is now transitioning its cable TV users to a full OTT solution. This strategic shift builds on years of investment in a robust Fiber-to-the-Home (FTTH) network, designed to deliver enhanced connectivity. However, the transition to a fully OTT-based service presents several challenges:

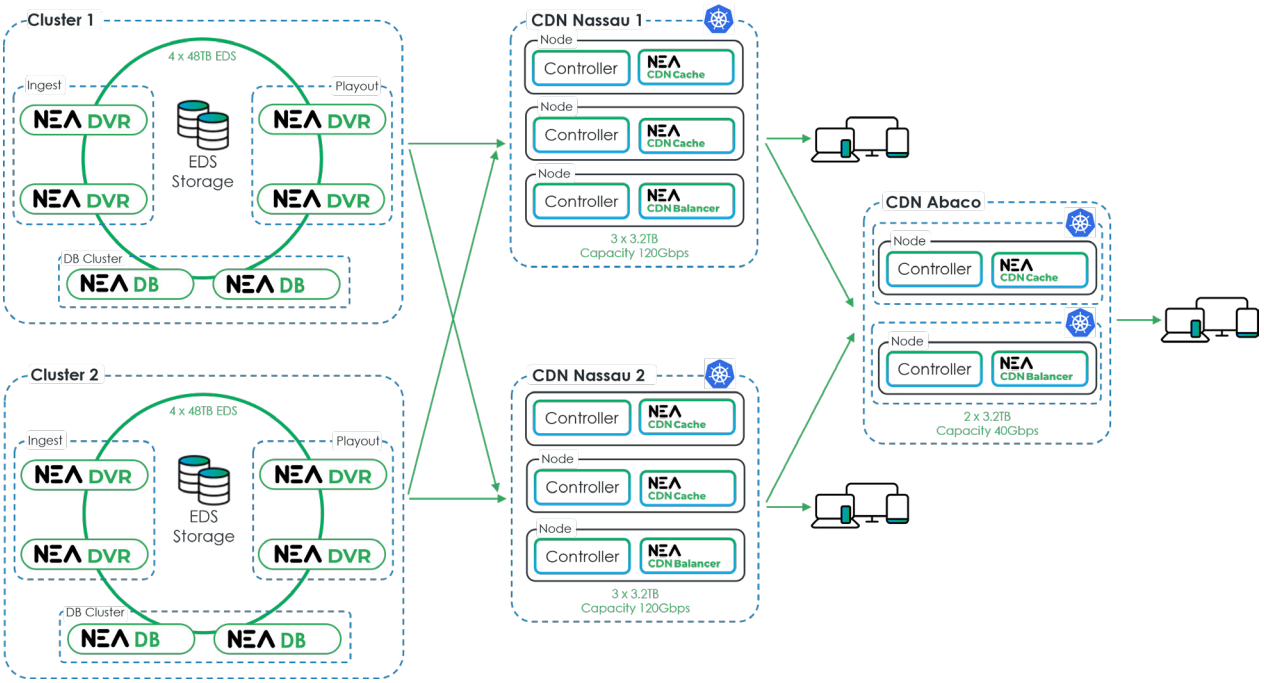
1. **Maintaining Premium Quality of Service:** Delivering a seamless live-streaming experience that matches the reliability of traditional cable services.
2. **Network-Based Recording Management:** Migrating Set-Top Box (STB) recording capabilities to the cloud while preserving recording capacity, usability, and secure content storage.
3. **Evolving Content Distribution Methods:** Adapting to new content distribution models while ensuring a smooth and uninterrupted viewing experience.

Given the Caribbean's unpredictable weather conditions, ensuring redundancy and content recovery was a critical aspect of this transition. To address this, Cable Bahamas established a second site in Nassau to complement the primary site, ensuring uninterrupted service even during extreme conditions.

Ateme's Dual-Site Solution
To achieve seamless redundancy, Ateme's solution enabled continuous synchronization between EDS clusters at Site A and Site B. This synchronization ensures alignment of video and audio segments, allowing for a smooth failover process between the two Content Delivery Networks (CDNs).

Key features of the dual-site solution include:
- **Instant Failover:** In the event of a failure at Site A, the system automatically switches to Site B, guaranteeing uninterrupted service.
- **Operational Parity:** Site B is equipped with identical capabilities to Site A, including the NEA-DVR EDS cluster and NEA CDN solution, ensuring consistent performance and high availability.

This dual-site deployment underscores Cable Bahamas' commitment to service continuity and delivering an exceptional user experience, even in the face of potential disruptions.



Conclusion

Cable Bahamas' partnership with Ateme exemplifies the power of collaboration and innovation in transforming digital media services. From its initial foray into OTT in 2016 to the deployment of dual-site redundancy systems in 2022, CBL has set new benchmarks for OTT services in the Caribbean. Through cutting-edge technologies such as the NEA DVR, EDS, and CDN solutions, CBL has created a scalable and resilient platform ready to meet evolving subscriber needs.

This journey highlights the importance of adaptability, customer focus, and technological excellence in achieving lasting success in the dynamic world of OTT services.