

Enhancing Spiritual Journeys with Black Box Emerald® IP KVM for Real-Time Crowd Intelligence, Safety, and Cyber Resilience Across Tirumala - India

Background

Every day, thousands of devotees visit the Lord Venkateswara Temple in Tirumala. To efficiently manage one of the world's busiest pilgrimage destinations, Tirumala Tirupati Devasthanams (TTD) established an Integrated Command & Control Center (ICCC) at the Vaikuntham Queue Complex. The ICCC consolidates live surveillance, AI-powered analytics, digital twin visualization, cybersecurity monitoring, and emergency response into a single mission-critical operations center.

Challenge

The ICCC receives live feeds from approximately 6,000 surveillance cameras together with multiple operational applications including video management, analytics, GIS, digital twin, and cybersecurity platforms. Operators required secure, real-time access to all these systems while rapidly switching between applications without compromising situational awareness or operational continuity.

Solution

AVFx Solutions designed and deployed this whole project including Black Box Emerald® IP KVM solution comprising Emerald transmitters, Emerald DESKVUE receivers and Boxilla® centralized management. Emerald became the operational backbone of the ICCC by providing secure, low-latency access to mission-critical applications from every operator workstation. DESKVUE enabled multiple applications to be viewed simultaneously on a single desktop, improving situational awareness and reducing workstation complexity. Boxilla simplified centralized device management, user administration and system monitoring. Through REST API integration with the third-party control system, operators can instantly switch sources, change layouts, and control AV functions from a unified touch interface. The architecture was designed with redundancy to ensure 24x7 operational availability and future scalability.

Result

The deployment delivered faster operational decision-making through real-time visualization of critical applications, improved operator efficiency with instant source switching and multi-window viewing, secure centralized management, seamless integration with the customer's control platform, and a resilient, scalable KVM infrastructure supporting continuous mission-critical operations.