



Case study

How did **Nagpur Metro** secure
36 stations through one integrated
access platform?

Nagpur Metro Rail Project was undertaken by Nagpur Metro Rail Corporation Limited (NMRCL), a joint venture of the Government of India and the Government of Maharashtra. The project spans a 34 km metro corridor across the North-South and East-West routes, comprising 36 stations, two depots, RSS and Metro Bhavan. With an approximate employee strength of 4,000–5,000, Nagpur Metro required an integrated physical security and attendance environment capable of supporting its geographically distributed infrastructure.

The Challenges

The major concerns faced by Nagpur Metro were:

- Managing a large employee population and their biometric identities across geographically distributed metro facilities.
- Controlling access to critical and restricted areas based on individual operational roles.
- Managing employee and vehicle access privileges across different facility types and security zones.
- Protecting depot perimeters against unauthorised intrusion and ensuring alarms reached the appropriate control centres.
- Maintaining reliable system operation while protecting critical access and attendance data against system failure or data loss.
- Coordinating access control with multiple operational and IT systems used across the metro environment.
- Managing attendance, identity enrolment and credential issuance consistently across a large and distributed workforce.

The Requirements

- Establish a common access control and time attendance platform across stations, depots, RSS and Metro Bhavan.
- Assign employee and vehicle access privileges according to authorised roles and zones.
- Provide fault-tolerant server architecture with protection against system failure and data loss.
- Enable biometric employee enrolment, ID card issuance and attendance management.
- Deploy perimeter intrusion detection at protected depot areas.
- Provide configurable access and attendance reporting.
- Integrate access control with key operational and IT systems used by Nagpur Metro.
- Support central monitoring and administration across distributed facilities.

The Solution

IDCUBE implemented Access360 as an open-platform access control and time attendance management solution across Nagpur Metro's geographically distributed infrastructure. The system covered stations, depots, RSS and Metro Bhavan, including critical areas requiring controlled entry and exit.

The deployment used a fault-tolerant architecture with a primary Access360 server at the Operation Control Center (OCC) and a secondary server at the Backup Operation Control Center (BOCC). Real-time data replication between the servers supported system availability and protected critical data against loss.

Access360 managed distinct access privileges for employees and vehicles across station control rooms, ticket offices, excess fare offices, technical rooms, wicket gates and authorised vehicle parking. Within Metro Bhavan, employee access to specific zones could be controlled according to assigned authorization.

At the depots, an integrated perimeter intrusion detection system used infrared beam sensors to detect intrusion near protected areas and escalate alarms to the control centres. Administrators could also centrally manage employee attendance data and access rights across stations. The solution architecture was designed to accommodate future expansion without major architectural changes.

The Smart Issuance module supported biometric fingerprint enrolment, employee ID card issuance and card printing. Access360 also provided configurable reporting, enabling administrators to generate access and attendance reports and schedule their delivery through email.

Access360 integrated with multiple operational and IT systems, including Master Clock, Fire Alarm System, T-SCADA, Automatic Fare Collection System, HRMS and CCTV System.

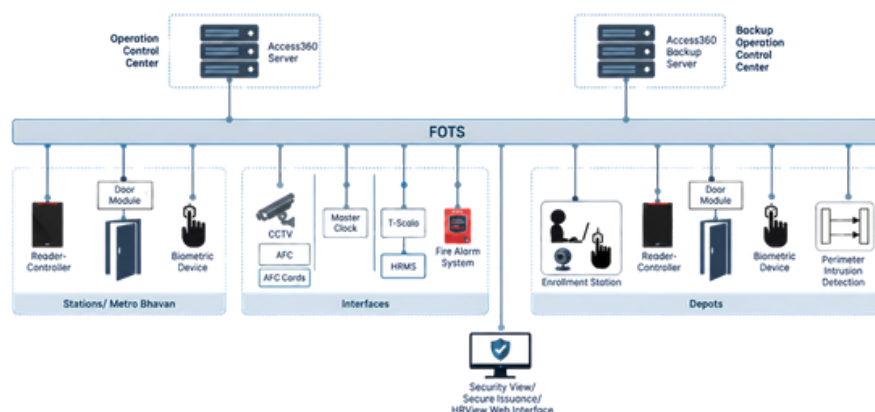
Master Clock integration synchronised the Access360 server clock, while Fire Alarm System integration automatically unlocked doors during a fire event. T-SCADA integration enabled access control alarms to be monitored through the T-SCADA HMI. Automatic Fare Collection integration enabled employees to use AFC cards for access to secured facilities. HRMS integration provided attendance logs for salary calculation, while CCTV integration enabled operators to monitor access-related alarms through the CCTV HMI.

The Result

The implementation delivered the following benefits to Nagpur Metro:

- **Stronger Physical Security:** Role-based access control helped protect critical areas across stations, depots, RSS, and Metro Bhavan by restricting entry to authorized personnel.
- **Unified Security Administration:** Nagpur Metro gained a common environment for managing employee identities, access privileges, and attendance across geographically distributed facilities.
- **Greater Operational Resilience:** Primary and backup server architecture with real-time data replication helped maintain system availability and safeguard critical information.
- **Integrated Security Monitoring:** Access control, intrusion detection, and connected operational systems could work together to support coordinated monitoring and response.
- **Streamlined Employee Management:** Biometric enrolment, ID card issuance, attendance management and configurable reporting were brought into an integrated workflow.
- **Better System Interoperability:** Integration with Master Clock, Fire Alarm, T-SCADA, AFC, HRMS and CCTV enabled Access360 to operate within Nagpur Metro's broader technology environment.
- **Scalable Infrastructure:** The architecture could accommodate additional data and future expansion without requiring major structural changes.

System Architecture



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