OCPP TECHNICAL SESSION

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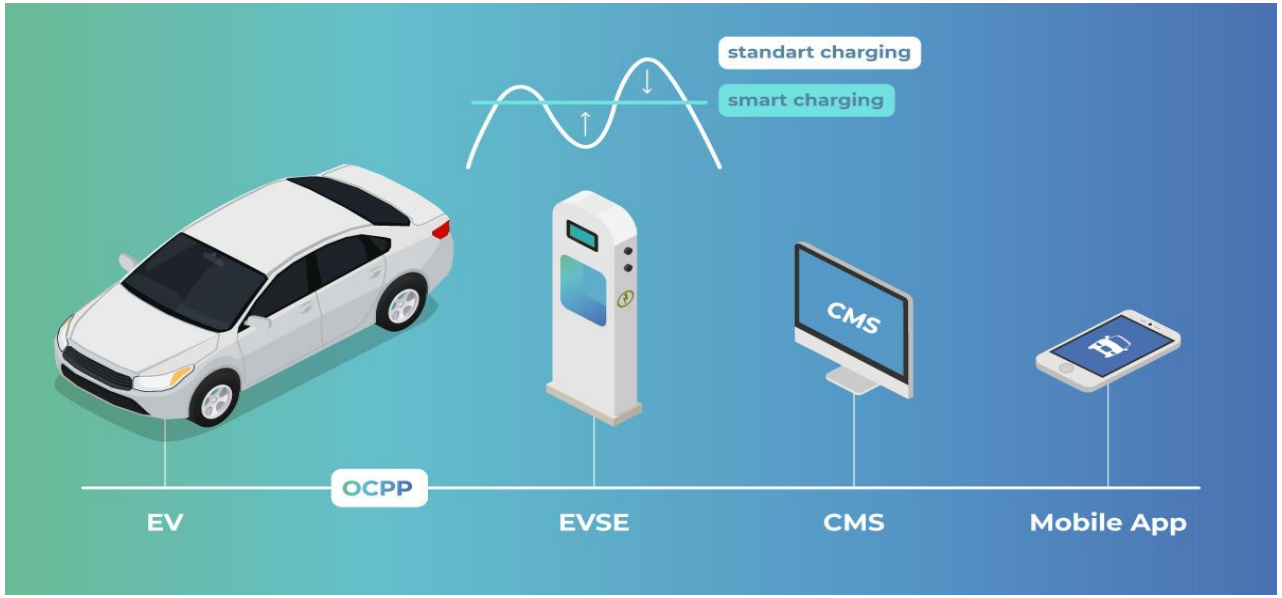
Recent Updates in OCPP

- ***IEC 63584, on October 20th, 2024, specifically approving OCPP 2.0.1 Edition 3***
- Enhanced security and data privacy features
- Improved transaction handling and smart charging capabilities
- ***Supports bidirectional charging and Vehicle-to-Grid (V2G) integration***
- Advanced diagnostics and real-time monitoring
- Compatibility with ISO 15118 for Plug & Charge functionality

Benefits of OCPP

- **Interoperability**
  - Enables seamless communication between
  - Suitable for India’s multi-vendor environment
- **Efficiency**
  - Optimized *load management to prevent grid overload in high-demand urban areas*
- **Scalability**
  - Nationwide EV infrastructure rollout under government policies
- **Remote Monitoring & Control**
  - Allows DISCOMs and CPOs to efficiently manage station uptime and maintenance



V2G and OCPP Integration

- **Standardized Communication for V2G**
  - OCPP allows bidirectional communication between the EV
  - OCPP 2.0.1 and later versions support advanced smart charging capabilities

- **Grid Stability & Renewable Energy Integration**
  - India is pushing for renewable energy adoption, OCPP can help integrate V2G with solar and wind energy
  - OCPP-enabled V2G can help DISCOMs manage grid fluctuations and peak demand more effectively

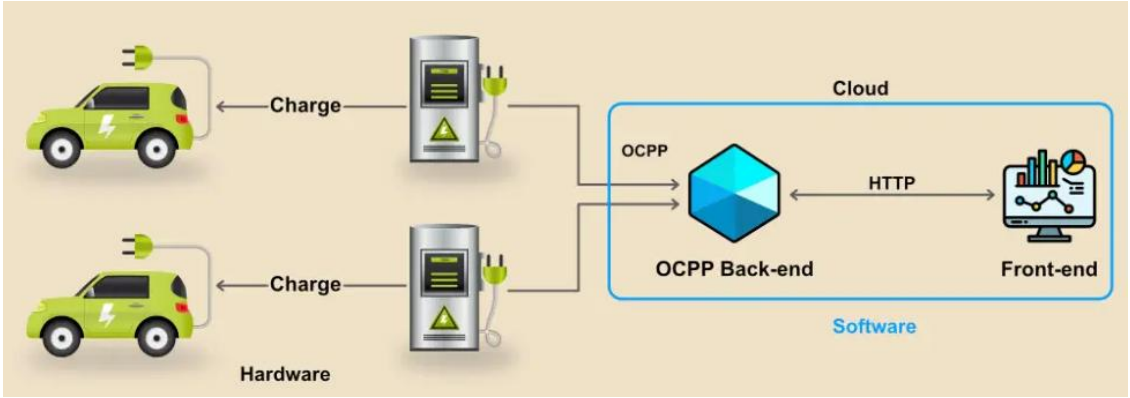
- **Dynamic Load Management**
  - OCPP facilitates **dynamic load balancing** by allowing chargers to optimize energy flow between vehicles and the grid
  - Helps DISCOMs avoid grid overloads by controlling when and how much energy EVs inject back into the system

V2G and OCPP Integration

- **Enabling Smart Tariffs & Incentives**
  - OCPP-based charging stations can interact with **Time-of-Use (ToU) tariffs** and real-time electricity pricing
  - DISCOMs can implement **demand response programs** to encourage V2G participation

- **Remote Monitoring & Control**
  - Through OCPP, utilities and charge point operators (CPOs) can remotely monitor, manage, and optimize V2G operations across different states and DISCOMs
  - Facilitates data-driven decision-making for grid operators

- **Security & Data Standardization**
  - OCPP 2.0.1 enhances cybersecurity for EV-grid communications
  - It ensures standardized data reporting and authentication, essential for large-scale V2G adoption in India



Challenges and Solutions Adopting OCPP & V2G

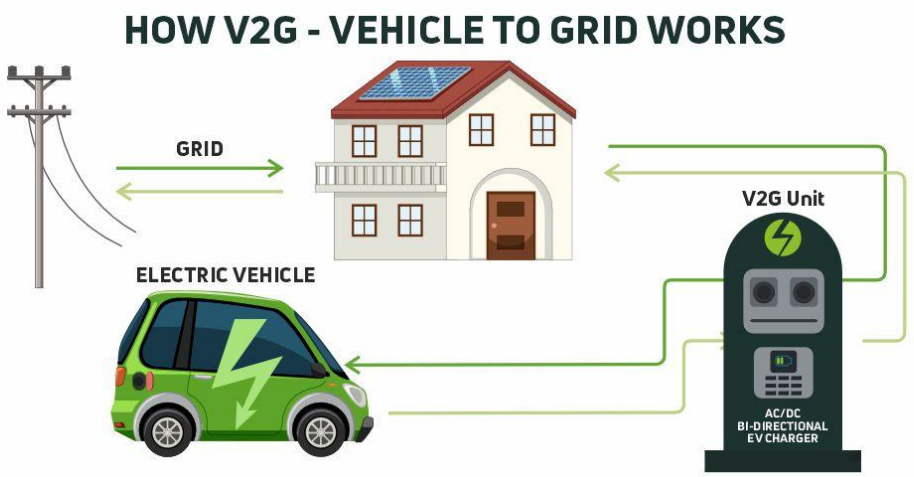
- **Technical Challenges**
  - Compatibility issues with legacy charging infrastructure
  - Need for real-time data exchange and DISCOM coordination
- **Regulatory & Market Barriers**
  - Lack of clear V2G policies and grid-integration frameworks
  - Need for financial incentives for DISCOMs and fleet operators
- **Technical Solutions**
  - Adoption of smart metering and AI-based grid forecasting to enable V2G
  - Standardization of OCPP with Indian EV charging infrastructure guidelines
- **Policy Recommendations**
  - Developing regulatory frameworks under the Ministry of Power & Ministry of Heavy Industries
  - Incentivizing utilities and private players for early V2G adoption

Future of OCPP & V2G

- **Emerging Trends**
  - Integration of OCPP with smart grid solutions in DISCOM operations
  - AI-driven predictive analytics for optimized charging
  - Blockchain-based transaction management for secure and transparent energy transfers

- **Impact on Indian EV Charging Industry**
  - Enhanced grid resilience and reduction of peak load stress
  - Growth in decentralized renewable-powered EV charging infrastructure

- **Final Thoughts**
  - OCPP and V2G are critical enablers for India's EV ecosystem
  - Collaboration between government, DISCOMs, and private sector is crucial for large-scale deployment



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