Fleet management systems are commonly used to coordinate mobility and delivery services in a broad variety of domains. However, their traditional top-down control architecture becomes a bottleneck in open and dynamic environments, where scalability, proactiveness, and autonomy are becoming key factors for their success. Here, the authors present an abstract event-based architecture for fleet management systems that supports tailoring dynamic control regimes for coordinating fleet vehicles, and illustrate it for the case of medical emergency management. Then, they go one step ahead in the transition toward automatic or driverless fleets, by conceiving fleet management systems in terms of cyber-physical systems, and putting forward the notion of cyber fleets.