



## **N2 - IEEE1588 - Precise Time Protocol**

**This course describes the PTP protocol and provides implementation examples**

### **Objectives**

- The course explains the IEEE1588 standard and details some implementation solutions
- The BMC algorithm is described
- The course emphasizes the way to implement IEEE1588 on an Ethernet system and highlights the boundary between software and hardware
- The new features of P1588 (aka IEEE1588v2) are studied

*A more detailed course description is available on request at [info@ac6-formation.com](mailto:info@ac6-formation.com)*

### **Prerequisites**

- Knowledge of Ethernet and switching is needed, see our course reference [N1](#)

### **Plan**

#### **INTRODUCTION**

- Objectives of the standard
- The need for synchronization
- Definitions

#### **PTP CLOCK SYNCHRONIZATION MODEL**

- The PTP messages
- PTP systems, acyclic graph structure
- Message filtering
- Clock properties, stratum, identifier
- Subdomain properties

#### **PTP PROTOCOL SPECIFICATION**

- Model of a subdomain of PTP clocks
- State behavior of clocks
- Protocol engine state machine
- Clock data sets, initialisation properties
- Messaging and internal event behavior of clocks

- Sync-event time-out mechanism
- Synchronization changes of the local clock
- Best Master Clock algorithm
- Clock variance computation
- Local clock synchronization
- Physical requirements for PTP implementations
- Management messages

### **ETHERNET IMPLEMENTATION OF PTP**

- Ethernet frame type
- IP header and multicast addresses
- UDP header, assigned port numbers
- UDP payload, organization of PTP messages

### **FREESCALE IMPLEMENTATION OF PTP**

- eTSEC Ethernet MAC
- Time-stamping
- Clock correction
- Trigger inputs
- Alarms

### **P1588**

- Mapping to DeviceNet and Ethernet layer-2
- Prevention of error accumulation in cascaded topologies
- Rapid network reconfiguration
- Extensions to enable implementation of redundant systems
- Optional shorter frame

## **Renseignements pratiques**

**Duration : 1 days**  
**Cost : 700 € HT**



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