Among the advantages of implementing the PTP as the time sync protocol instead of the IRIG-B, four can be emphasized. The first one is related to the time accuracy of the PTP that reaches nanoseconds range, this high accuracy of the protocol is obtained by compensating the propagation delay of the information between the sync source and the destination. The IRIG-B protocol can not be so accurated as PTP, being the time accuracy in the miliseconds range considering the modulated code. According to IEC 61850-5 Ed. 2 (performance class T5) and IEC 61869-9 the accuracy defined for synchronization in the Process Bus must be better than 1µs, which means approximately 0.02º of phase precision. Below, Figure 1 illustrates this issue.

	IRIG-B	(S)NTP	PTP
Accuracy (typical)	1 ms–10 ms	1 ms–10 ms	100 ns–1 ms
Transport media	Dedicated cables	Ethernet cables	Ethernet cables
Protocol style	Master-slave	Client-server	Master-slave
Built-in latency correction	No	Yes	Yes
Set-up	Configured	Configured	Self-organizing, or configured
Update intervals	1 second	Minutes	10 ms–1 s
Specialized hardware	Required	No	Required

Figure 1 - Time Sync Protocols Comparison

The second advantage of PTP compared with IRIG-B is related to money savings due to PTP be a Ethernet network time sync protocol and use just Ethernet cabling. IRIG-B needs coaxial cabling, so this issue increase the costs of implementing the protocol compared to PTP.
The third advantage of PTP is related to the simplicity of the protocol implementation that uses just the Ethernet network, while IRIG-B needs a dedicated circuit.
The fourth advantage of PTP is related to the communication time delay compensation, composed by the transport media delay (Ethernet network cabling) and the Switch latency, which is done in a dynamic way due to PTP algorithm. IRIG-B, however, compensates the time delay in a static way.
PTP has just two disadvantages compared with IRIG-B. One of these disadvantages appear when the PTP is applied as the time sync protocol of the Process Bus. PTP can be disrupted and lose synchronization momentarily, due to loss of packets, if not isolated from the Process Bus traffic using VLAN, while IRIG-B can not be affected by the Process Bus traffic. The second disadvantage is related to the technology consolidation: PTP is a recent protocol considering the first version released in 2002 and the second version released in 2008, while IRIG-B is a stable protocol whose first version was released in 1960.
Below, Table 1 summarizes this comparison between PTP and IRIG-B.

Table 1 - PTP and IRIG-B Comparison

PROTOCOL/FEATURES	A/D*	PTP	IRIG-B
Accuracy	A	< 1µs	≥ 1ms (modulated code)
Cabling	A	Ethernet cabling	Coaxial cabling
Hardware	A	Ethernet network	Dedicated circuit
Time Delay Compensation	A	Dynamic	Static
Process Bus Traffic	D	Affected	Not affected
Technology	D	Recent	Consolidated

* A: Advantage, D: Disadvantage