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IEEE-1588 TIME REFERENCE SYSTEM

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INAF OATs

In accordance with the guidelines established by the *STILES* project and its objectives, *INAF OATS* has acquired a set of instruments produced by *Meinberg Funkuhren*, for IEEE-1588 compliant time reference distribution and 10MHz reference signal.

- **Meinberg MicroSync Grandmaster Clock RX301 – GPS based**
  Offering multiple programmable output signals, has the ability to synchronize both NtP and PtP devices.

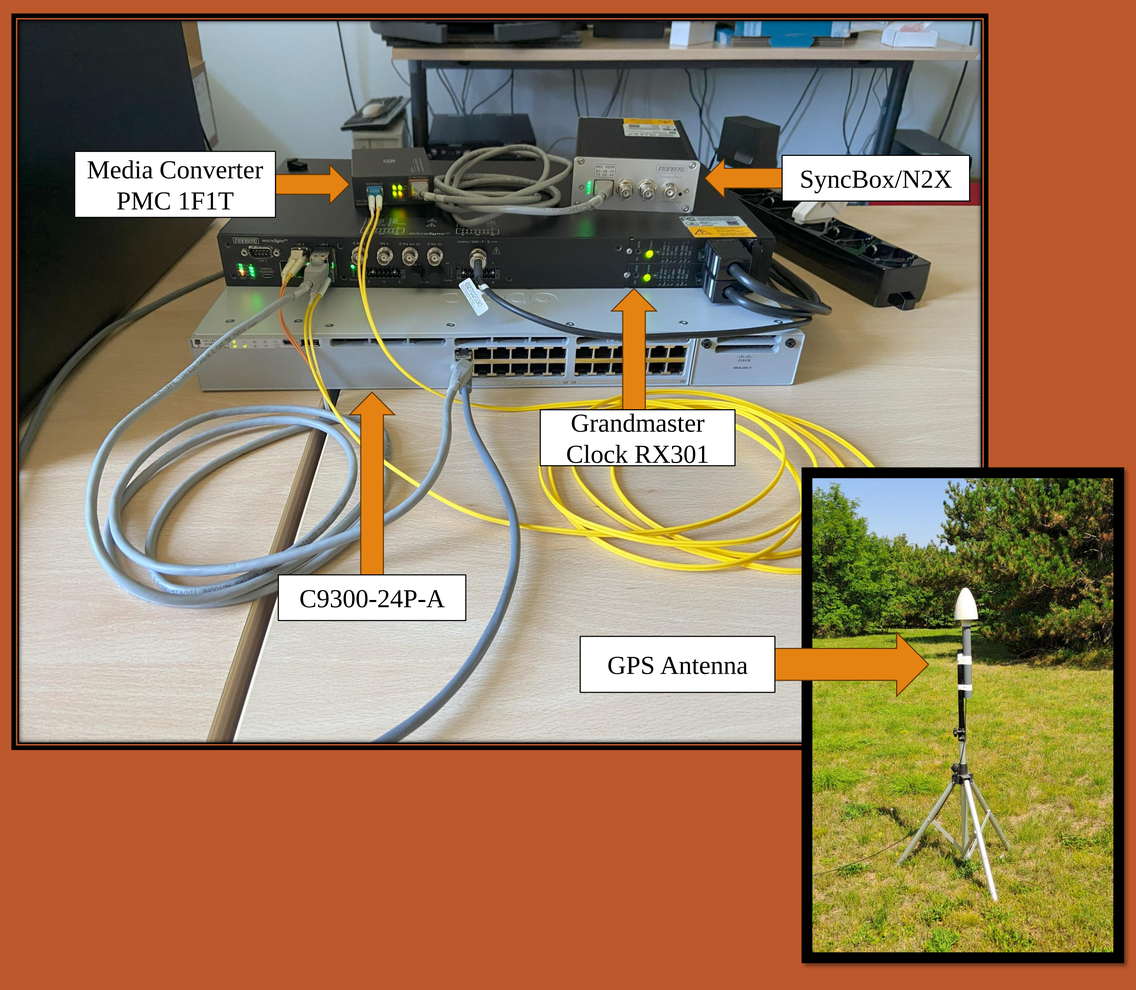
- **Oregano Systems syn1588 PCIe Network Interface Card**
  Includes dedicated hardware to implement high accuracy clock synchronization following IEEE-1588 standard.

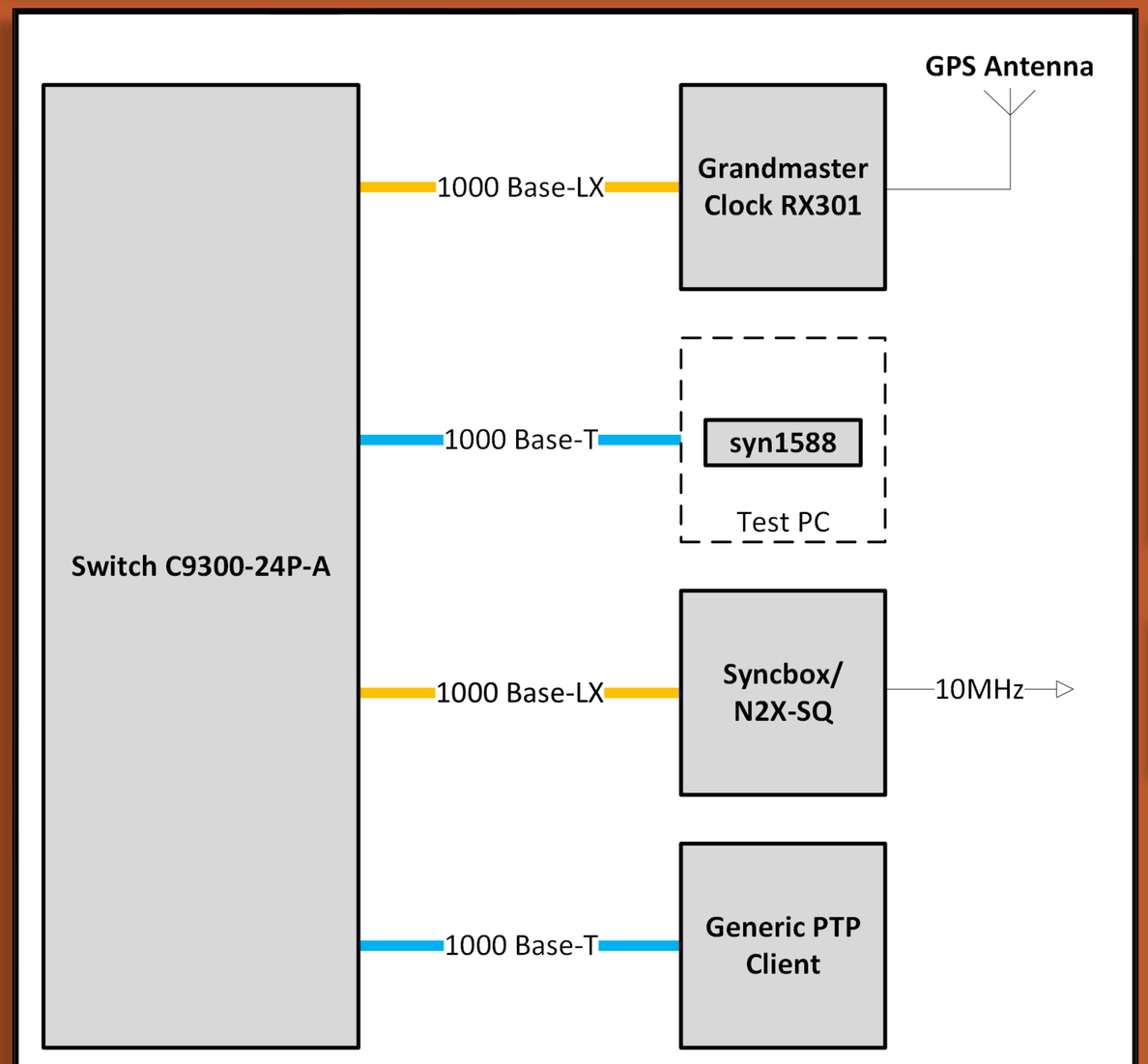
- **Meinberg SyncBox/N2X-SQ**
  Can be used as a time source for equipment that requires IRIG AM, variable-frequency sine waves, serial time string or a variety of other programmable pulse types for synchronization.

- **FS Media Converter PMC 1F1T**
  Extends communication distance with high performance of data transmission via fiber optic cable.

To upgrade its laboratory connections and fully support IEEE-1588, INAF OATS has also acquired:

- **Cisco C9300-24P-A switch**
  Built for secure Wi-Fi 6/6E high-speed access and beyond with 90W PoE, 24-port 10GBASE-T, 10G/5G/2.5/1G multigigabit.





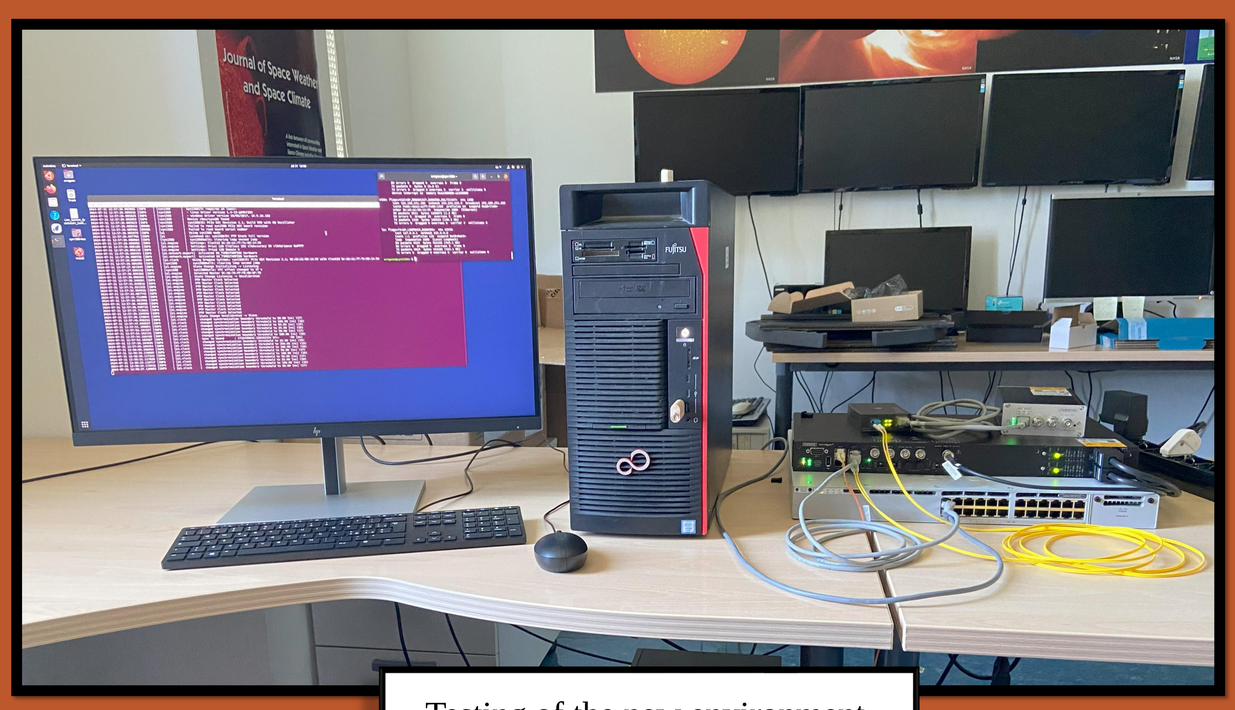
This graph shows how the C9300-24P-A can boost interconnectivity between instruments.

To ensure an accurate and precise synchronization of clocks in measurement and control systems, most modern astronomical instruments rely on the **IEEE-1588** standard for a practical networked environment. Aiming to synchronize the instruments of INAF-OATs laboratory, a dependable Time Reference System was assembled.

For this purpose, we installed the RX301 Grandmaster Clock, which will govern any future implementation of our laboratory through precise time frequency management. Thus, we were able to lay the foundation of a sound Time Reference System with a 10MHz distribution to all laboratory instruments and PtP network clients.

The synergy of these instruments is then provided by the IEEE-1588 fully compliant C9300-24P switch.

For now, this setup has only been tested in a controlled environment inside our laboratory, but we are ready to fully integrate it in INAF-OATs network. The results of our first testing phase have been very positive, with a measured accuracy of microsecond level.



Testing of the new environment.

Meinberg MicroSync Grandmaster Clock RX301

Cisco Switch C9300-24P-A

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PNRR
Missione 4 • Componente 2
Investimento 3.1
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