## MIB

Each agent in the network has a set of MIBs (**M**anagement **I**nformation **B**ase), a MIB is an object that can be called by a manager. Information can either be standard information such as port status or port state, or company specific MIBs (private) for example the temperature inside the device.

MIBs are structured tables made up of the different objects that can be called. The structure can be compared to a tree with a root and underlying directories. On the lowest level are directories for the standard MIB and for private MIBs.
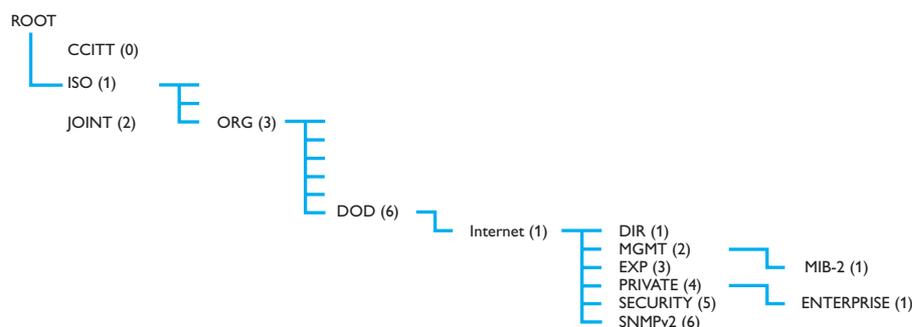
OPC

An alternative to SNMP is OPC, which is an acronym for OLE for Process Control. This is a series of standards specified for information exchange within industrial automation. One of the purposes of these standards is to improve efficiency and minimise the need of supplier specific drivers. Numerous different drivers usually results in complex implementation as several applications need to interact and exchange information.

The OPC specifications include functions for:

- **OPC D**ata **A**ccess or (OPC DA) Access of data between applications, exchange of information between systems in real time.
- **OPC H**istorical **D**ata **A**ccess (OPC HDA) used for historical process data and analysing trends.
- **OPC A**larm and **E**vents (OPC A&E) Control of alarms and events.
- **OPC D**ata e**X**change (OPC DX) defines how the exchange of data should occur between different OPC servers.

⋮⋮⋮ **OPC** e**X**tensible **M**arkup **L**anguage (commonly known as OPC XML) HTML based language for information exchange between applications.

In order to illustrate the problems, assume that three applications need to exchange information between two PLCs and an operator panel (HMI).

Each supplier has his own specific application with its drivers. The drivers need to download data from respective PLCs and HMI, here this results in nine integration points.
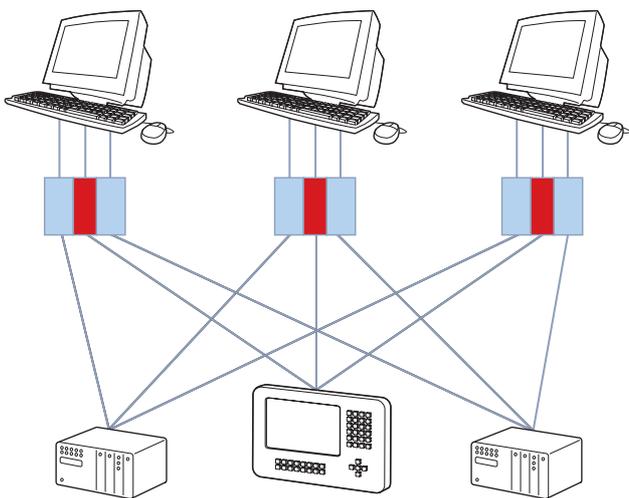
OPC simplifies this by using standard tools. The development of OPC is the result of collaboration between leading automation suppliers and Microsoft. Technically, Microsoft's COM (**C**omponent **O**bject **M**odel) and DCOM (**D**istributed **C**omponent **O**bject **M**odel) are used for the communication between applications. Consequently, in this example each PLC and HMI only has one connection point, which in turn leads to simpler and more cost effective implementation of the entire system.

These advantages and possibilities have led to component suppliers of systems implementing direct support for OPC on equipment.