## What is a Logical Node?

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Motivation

The standard IEC 61850 "Communication networks and systems in substations" and the coming standard IEC 61400-25 "Communications for monitoring and control of wind power plants" use the concept of **Logical Nodes (LN)** as a key element to define the information of a device to be communicated. This paper introduces the concept of LNs.

## Modeling concept

Key issues are the LNs **representing functions** or **equipment** used in power systems. Each LN provides a list of <u>well organized and named information</u>. The LN "**XCBR5**" represents the "circuit breaker" number 5 with the data "**Pos**" (Position) and "**Mode**". Services defined in IEC 61850-7-2 allow the exchange of this information (Client/Server, GOOSE, SV, ...).



The substation configuration language in part 6 supports the engineering process.

The measurement LN "MMXU" represents power, voltages, currents, and impedances in a three-phase system. The values can be communicated by various services



The "MMXU" LN offers hundreds of values: measured (process) values, configuration values, description, and substitution values. These values can be communicated by various services like read (polling), notification (publish/subscribe), logging and query.

## IEC 61850 models substation equipment and functions (focus is on protection)

IEC 61400-25 models components of wind power plants

IEC 62344 models components of hydro power plants

IEC 62350 models components of decentgralized energy resources (DER)

IEC 61850 extensions model more monitoring data

> Example LN "MMXU"

IEC 61850-7-4 defines some 90 LNs 500 Data 100 Attributes 10 Service models IEC 61400-25

adds some 10 LNs 200 Data 100 Attributes