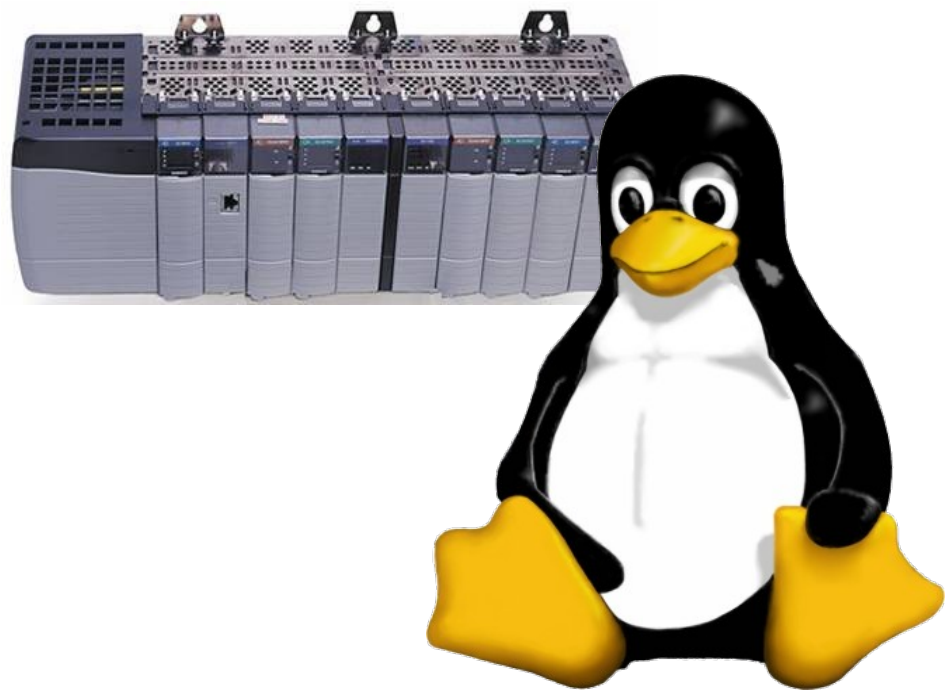
TuxSql



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WARNING

DON'T connect to a PLC unless you are certain it is safe to do so!!! It is assumed that you are experienced in PLC programming/troubleshooting and that you know EXACTLY what you are doing. PLC's are used to control industrial processes, motors, steam valves, hydraulic presses, etc.

You are ABSOLUTELY RESPONSIBLE for ensuring that NO-ONE is in danger of being injured or killed because you affected the operation of a running PLC.
Also expect that buggy drivers could write data even when you expect that they will read only !!!

Purpose	TuxSql is a modular data logging application. TuxSql is constituted by a set of applications. Each application is in charge of a particular task : Reading from devices (data acquisition), Data logging, visualization (CGI form)
Todo	I have to improved the automatic reconnection in case of network trouble.
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Content

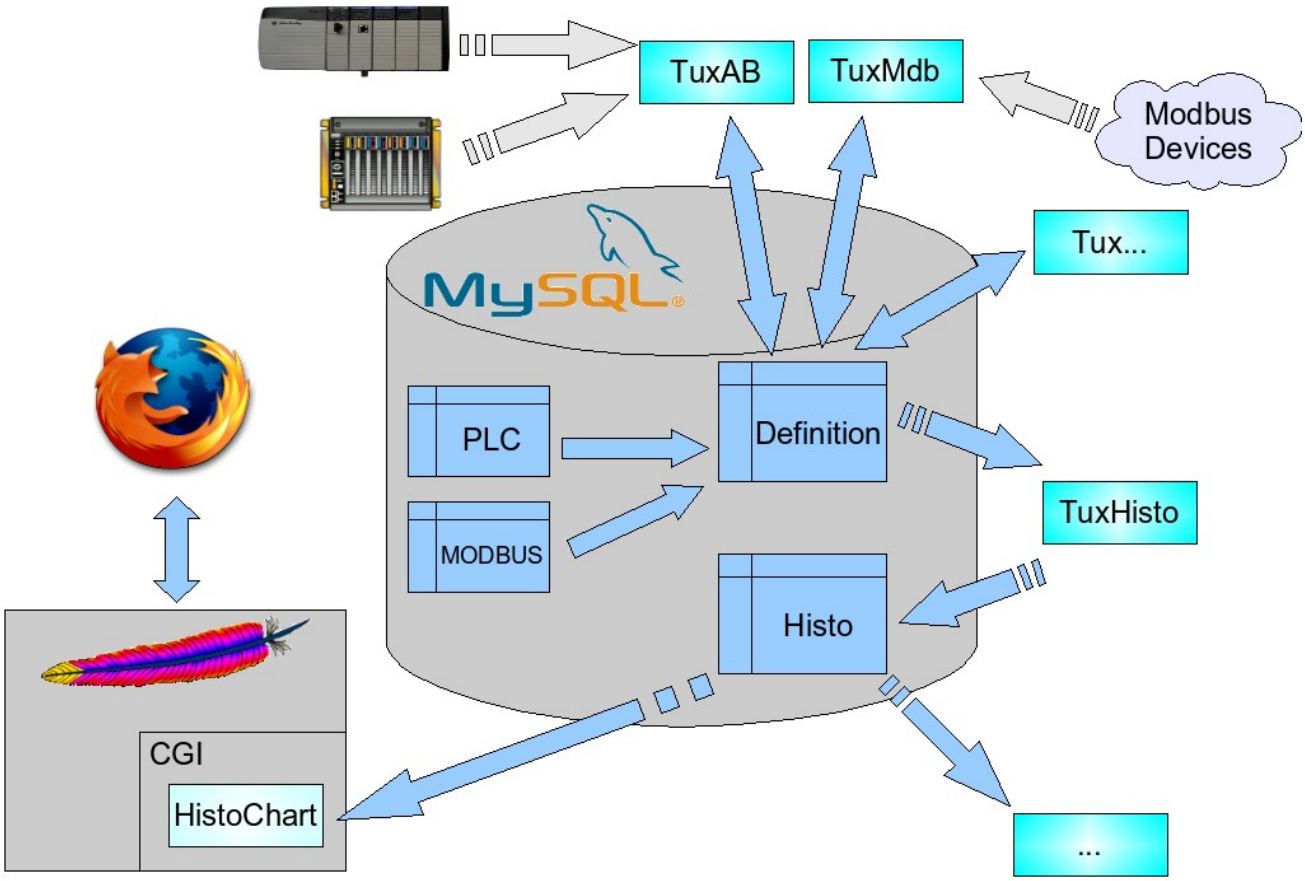
1 Overview

1.1 TuxSql

TuxSql is a modular data logging application constituted by a set of applications. Each application is in charge of a particular task :

- TuxAB : data acquisition in Allen Bradley logic controllers
- TuxMdb : data acquisition in Modbus devices
- TuxHisto : data logging
- Histochart : this is a CGI (***Common Gateway Interface)*** that return an historical trend of values stored in your database.

1.2 Organisation



2 Database

2.1 Table organisation

- Definition : contain all your tags definitions (plc, address, scale , last value ...).
- Histo : contain historical values of each tag you want to store.
- PLC and MODBUS : this tables contain the way to access devices used by each data acquisition programs (for example, TuxAB use PLC and TuxMdb use MODBUS).

2.2 Data fields explanation

2.2.1 *Definition* table

Column name	MySql data type	Description
ID	int(11)	Tag ID (the primary key of this table)
TAGNAME	varchar(30)	The Tag name you give
TAG_DEFINITION	varchar(100)	comment about the tag
ADDRESS	varchar(40)	The tag address (depend on the device you access)
DATA_TYPE	varchar(10)	The data type of the tag (not used a this time)
PLCNAME	varchar(30)	The name of the Plc you want to access (it must match an entry in an another table)
TIME_SAMPLE	smallint(6)	The frequency at witch you want to read the tag (in second)
TIME_REFRESH	int(6)	Maximum amount of time between two sample in the *Histo* table
TIME_CLEANING	smallint(6)	How long we store values in the *Histo* table (in days)
HYSTERESIS	smallint(6)	If the value variation is over the hysteresis percentage then we store this value in the *Histo* table
I_MIN	double	the input lowest raw value
I_MAX	double	the input highest raw value
O_MIN	double	the output lowest scaled value
O_MAX	double	the output highest scaled value
TAG_UNIT	varchar(20)	the physical unit of the value (if any)
RECORDING	tinyint(4)	Do we record it in the *Histo* table ? 0 if not else 1
READING	tinyint(4)	Do we read this tag ? 0 if not else 1
SNAPSHOT_VALUE	double	the last raw value of this tag
SNAPSHOT_TIME	datetime	the last time we read this tag
DIGITAL	tinyint(1)	is this tag a boolean ? 0 if not else 1
TAG_SYSTEM	char(2)	In which system do we read this tag ? (AB : Allen Bradley, MB : Modbus ...)

2.2.2 *Histo* table

Column name	MySql data type	Description
ID	integer	Tag ID (the primary key of this table)
TIMEVALUE	datetime	time value of this record
DATAVALUE	double	raw value of the tag

2.2.3 *PLC* table

Column name	MySql data type	Description
PLCNAME	varchar(30)	The plc name you choose (must be unique in this table)
PLC_PATH	varchar(50)	The path to access your plc[1]
PLC_TYPE	varchar(15)	The kind of plc, values are : SLC,PLC,LGX
PLC_NETWORK	varchar(10)	The kind of network : CNET,DHP_A,DHP_B
PLC_NODE	smallint	The node number of your plc
PLC_ENABLE	tinyint	Enable/disable the reading of this plc (0,1)

2.2.4 *MODBUS* table

Column name	MySql data type	Description
PLCNAME	varchar(30)	The plc name you choose (must be unique in this table)
PLC_PATH	varchar(20)	The path to access your plc
DEVICE_ID	smallint	Device ID according to the Modbus protocol
PLC_ENABLE	tinyint	Enable/disable the reading of this plc (0,1)

3 Applications explanation

3.1 TuxAB

The object of TuxAB is to retrieve data from Allen Bradley plcs, it is based on my TuxEip library. This program needs two table, the first one is “PLC” which describe the way to join the plcs you use (to fill out fields of this table, you can have a look at the TuxEip doc).The second one is the “Definition” table which contain definition of tags you want to read.

usage : tuxab [-d] [-o timeout] [-w wait] [-t] [-l0-3] [-s] [-b] [-u] [-p] [-c controllers,..] [-f pidfile] [-?,h]

- d daemonize tuxab
- o Cip Timeout (default :1000 msec)
- w Time to wait if error before reconnection (default :60 sec)
- t Test (there is no database update)
- l (0-3) Level of messages return by TuxAB (default : 1)

  values are :

  - 0 LOG_ERR
  - 1 LOG_WARNING
  - 2 LOG_NOTICE
  - 3 LOG_DEBUG
- s Database host (default : localhost)
- b Database name (default : histosql)
- u Database Username (default : histosql)

1 to fill out this fields, you can have a look at the TuxEip doc

- p Database Password (default : histosql)
- c Controller (you can define here the list of plcs you want to read)
- f Pid file (when starting, TuxAb will write his Process ID in this file)

3.2 TuxMdb

The object of TuxMdb is to retrieve data from Modbus devices, it is based on a Modbus library of mine. This program needs two table, the first one is "MODBUS" which describe the way to join the plcs you use .The second one is the "Definition" table which contain definition of tags you want to read.

usage : tuxmdb [-d] [-o] [-T] [-t timeout] [-l0-3] [-s] [-b] [-u] [-p] [-c] [-f pidfile] [-?,h]

- d daemonize tuxmdb
- o No read optimization
- T Test (there is no database update)
- t Timeout (default :1 sec)
- l (0-3) Level of messages return by TuxAB (default : 1)

  values are :

  - 0 LOG_ERR
  - 1 LOG_WARNING
  - 2 LOG_NOTICE
  - 3 LOG_DEBUG
- s Database host (default : localhost)
- b Database name (default : histosql)
- u Database Username (default : histosql)
- p Database Password (default : histosql)
- c Controller (you can define here the list of plcs you want to read)
- f Pid file (when starting, TuxAb will write his Process ID in this file)

3.3 TuxHisto

TuxHisto have two goal, first one is to store « real time values » from the *Definition* table and to store them in the *Histo* table. The second one is to remove oldest data value from the *Histo* table.

usage : tuxhisto [-d] [-l0-3] [-s] [-b] [-u] [-p] [-?,h]

- d daemonize tuxhisto
- l (0-3) Level of messages return by TuxAB (default : 1)

  values are :

  - 0 LOG_ERR
  - 1 LOG_WARNING
  - 2 LOG_NOTICE
  - 3 LOG_DEBUG
- s Database host (default : localhost)

- b Database name (default : histosql)
- u Database Username (default : histosql)
- p Database Password (default : histosql)