

HAL status for VME64x:

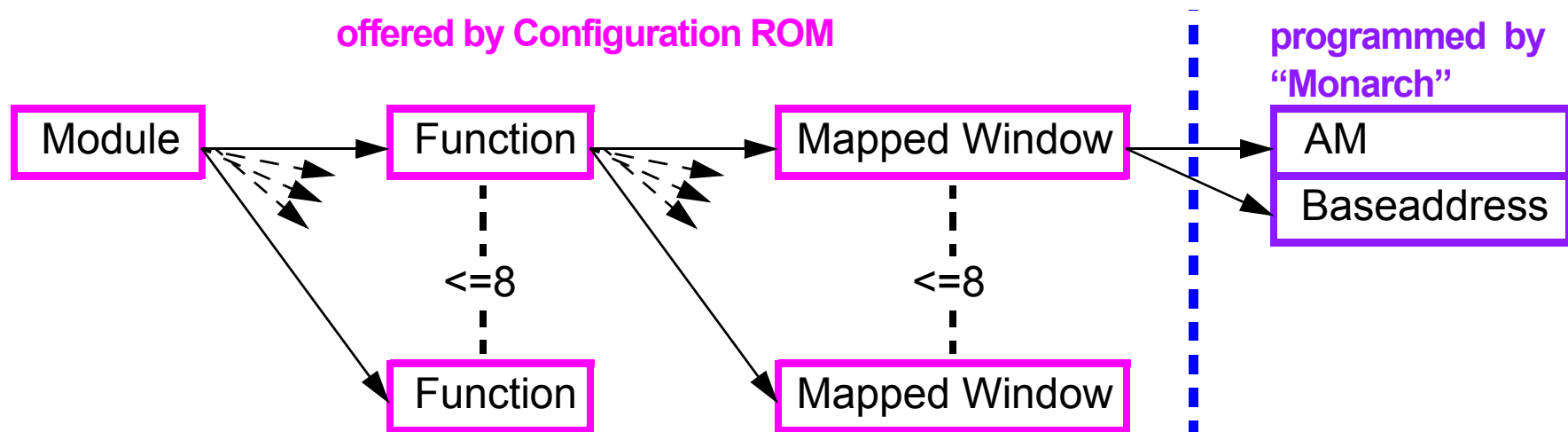
- New features
- VME64x related Features
- still pending...

VME64x Plug and Play configuration

- It has been proposed to design custom modules in CMS according to VME64x to allow for “Plug and Play”.
 - document available at <http://cmsdoc.cern.ch/~cschwick/VME/index.html>
- Software to support Plug and Play is now available in the HAL
 - Runs in **XDAQ environment and stand-alone**
 - Needs to run in XDAQ environment in order to access database.
- Features of the package:
 - Compatibility with “Standard VME” modules and “mixed” systems
 - Information on non - plug and play modules are given to the library before configuration
 - So far support for **A16, A24 and A32** addressing and **D8, D16 and D32** data width.
 - Serial Number in Configuration ROM is used to map hardware device to it's Address tables
AddressTables are automatically retrieved.
 - Checks consistency between AddressTable and configuration ROM entries.
 - Automatic mapping of the address space.

VME64x : steps to configure a crate

- 1) **read static configuration** of “Standard” VME Modules
- 2) **check** if there is a module on the “**Amnesia address**” 0x1e
(throws exception if module found)
- 3) **probe** each slot without static configuration for VME64x module
 - check Identification bytes and VME-version
 - verify the checksum of the Configuration ROM
 - read out serial number and retrieve module TypeId from “ModuleMapper”
(Database or ASCII file)
 - read out address space requirements and addressing capabilities
- 4) **Map the address space** of all VME64x modules found
 - consider the static mapping of standard VME modules.
 - choose addressModifier using a simple priority scheme.



Standard VME : A mapped region is addressed with **various AMs**

VME64x : A mapped region is addressed with **a single AM**

5) Enable the VME64x modules

- this makes the VME64x modules start answering to VME requests

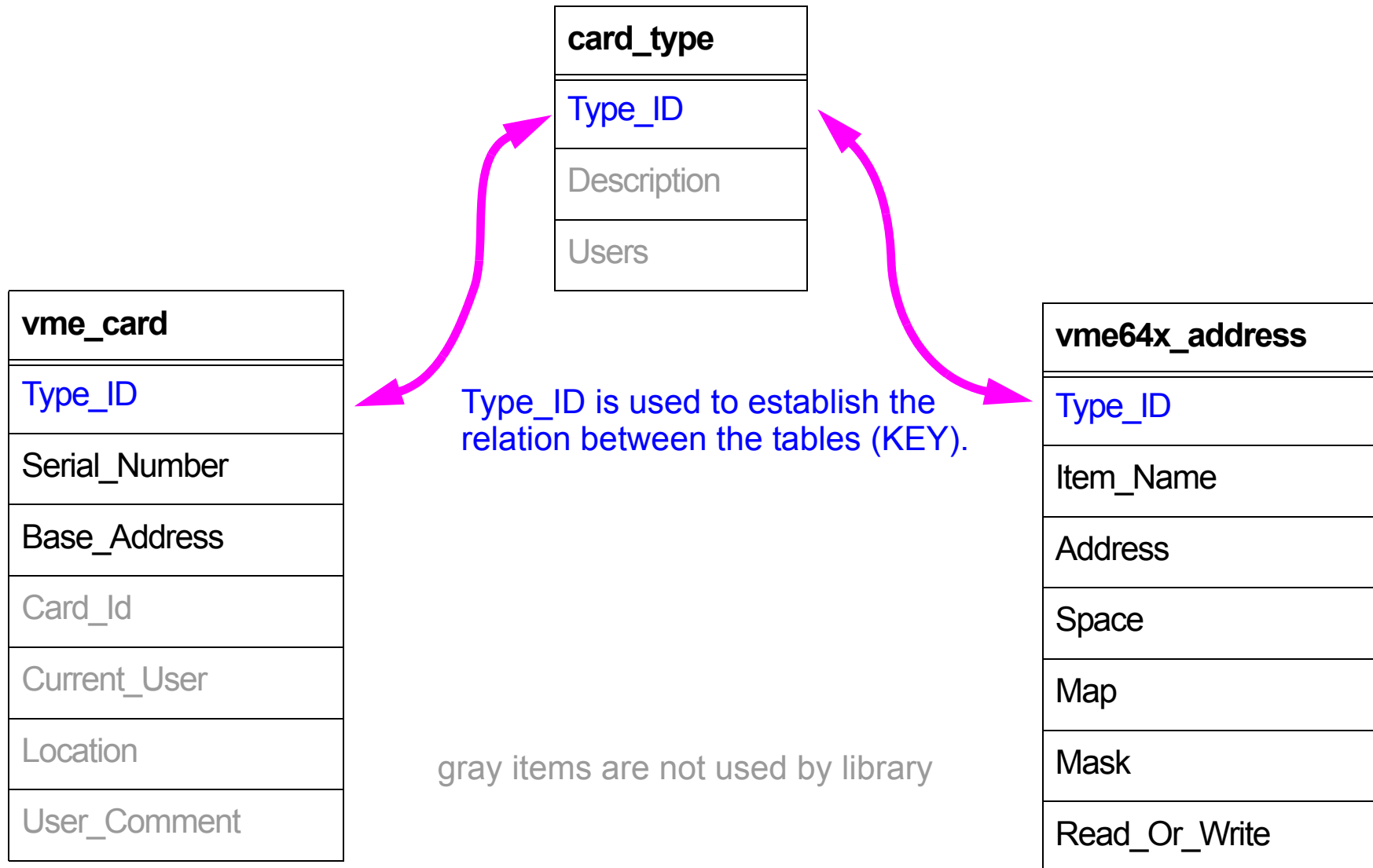
6) Obtain VMEDevices form configuration:

- **AddressTables** are retrieved from "AddressTableContainer" (maps typeId to specific AddressTable via database or ASCII file).
- AddressTables are **checked** against the mapped address space (for consistency)
- **VMEDevice** is **constructed** and returned

Module Mapper and AddressTableContainer:

- **Module Mapper:**
 - maps serial numbers to typeld
 - for standard VME modules: maps serial numbers to baseaddress
- **AddressTableContainer:**
 - retrieves AddressTables for a given typeld
- **Both exists for two data sources: Database or ASCII file**

Database version



Module Mapper and AddressTableContainer: ASCII File version

- Can be used for tests or small setups without database access
- ASCIIModuleMapper Table Format:

```

*****
*serialNumber          typeId          baseaddress
*
trackerFed-0001       trackerFed       00000000
trackerFed-0002       trackerFed       00000000
ttcvi-00143           TTCvi           00900a00

```

```
*****
```

(TTCvi is a standard VME module and needs a baseaddress)

- ASCIIAddressTableContainer Table Format:

```

*****
*typeId          technology          XMLAddressTableFile
*
trackerFed       vme                TrackerFEDAdrTable.xml
fedkitGIII       pci                fedkitGIIIAdrTable.xml

*****

```


Other HAL changes

- SBS busadapter byte swapping strategy can now be changed by user.
- PCli386BusAdapter now allows to change byte swapping strategy
 - Necessary for cards which work only in big-endian (Myrinet NIC)
- New library libHALUtilities.so contains some useful classes for test setups.
- Tools (c++ or scripts) for various purposes:
 - to convert ASCII address tables into XML files or sql scripts to fill ORACLE database.
 - to calculate the checksum of an ASCII representation of a VME64x Configuration space.
 - to convert a string (serialNumber) into ASCII code (for Configuration ROM)
- Offsets are now checked to not run out of the limits of the AddressTable.
- VME64xDummyBusAdapter allows to play with VME64x software without real hardware
 - configuration space data is contained in ASCII files

Status:

- Implementation is tested with 2 ECAL VME64x modules
 - DCCTester and DCC
 - Hardware design by Carlos can be obtained from him (XILINX FPGA)
- Included in current HAL version

Pending Items

- **Shortcomings in current VME64x software:**
 - The crate is automatically configured when the VME64x class is instantiated.
 - This does not work if different applications access the modules in the crate
 - User needs control on crate configuration (and querying the configuration state of a crate)
 - Status: being worked on since yesterday (solution expected end of the week)
- **Concept of the channel**
 - ...still pending...