Function Discovery (IEEE1212 / IEEE 1394)

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PWG-C

The need for **F**unction **D**iscovery

- **There is a need for <u>a common (protocol/bus independent) method for finding (describing) a function</u> in a multi-device(node) topology.**

  "How do we find a printer in a multi-device topology?"

  - **"We don't want to utilize a specific protocol JUST to find a function in a topology"**

    - **Approved as a need by IEEE MSC**

      (IEEE1212 task group)

    - **Other proposals addressing same issue**

      - SDD , "Proposal to add mode_unit_id" etc.

Function Discovery scheme
- Objective

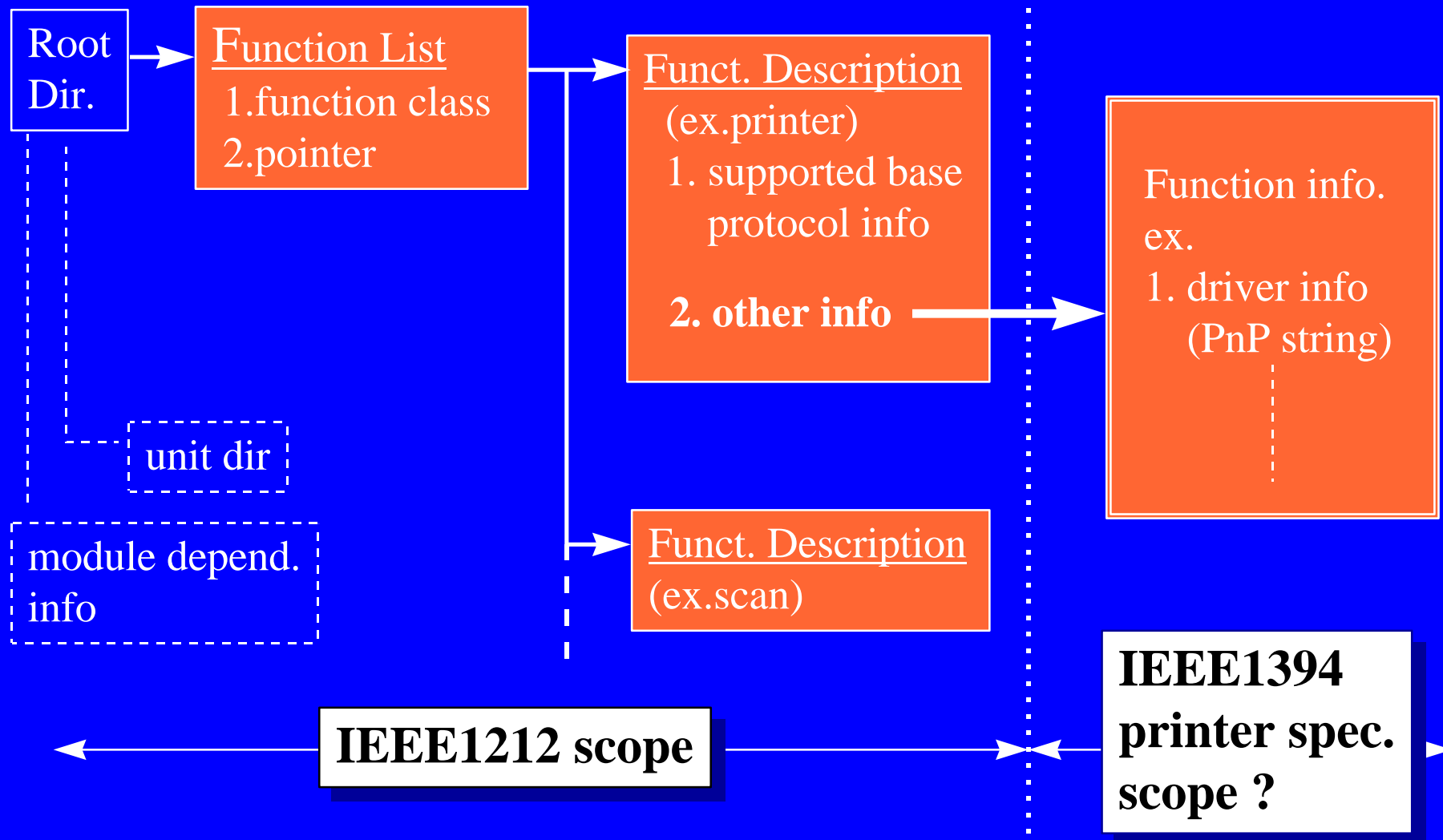■ **Objective:**

● Provide a

protocol (1212 unit directory) independent

method for :

Function Discovery.

- **"Discover the <u>functions first</u>,**
then their supported protocols.
(and further function description...driver info.)"
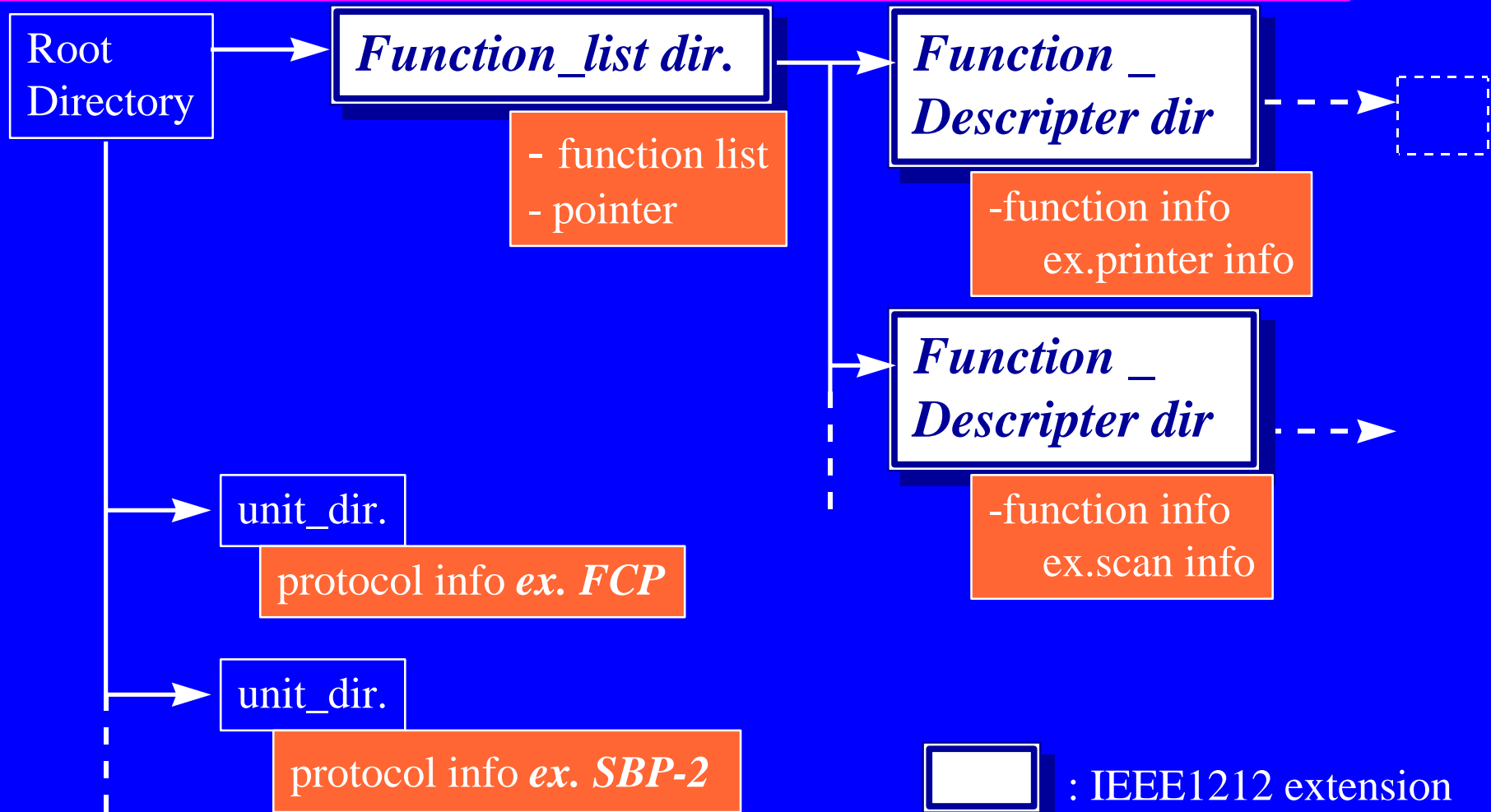
as an alternative to current "protocol-first" discovery.

Function Discovery scheme
- What should be where ?

Root Dir. → Function List
1.function class
2.pointer

→ Funct. Description
(ex.printer)
1. supported base
   protocol info

2. other info →

Function info.
ex.
1. driver info
   (PnP string)

unit dir

module depend.
info

→ Funct. Description
(ex.scan)

IEEE1212 scope

IEEE1394 printer spec. scope ?

Part 1:
IEEE 1212 (reaffermation)
Function Discovery Standard
- FDS

IEEE1212 FDS Extention

Root Directory → **Function_list dir.** → **Function _ Descripter dir** ⤏ [ ]

Function_list dir.
- function list
- pointer

Function _ Descripter dir
-function info
ex.printer info

Function _ Descripter dir ⤏
-function info
ex.scan info

unit_dir.
protocol info *ex. FCP*

unit_dir.
protocol info *ex. SBP-2*

[ ] : IEEE1212 extension

Root directory

key_type/ Key_values	Bus_Dependent_Info
	Module_Dependent_Info
	Node_Dependent_Info
	function_list dir offset

pointer to function_list directory
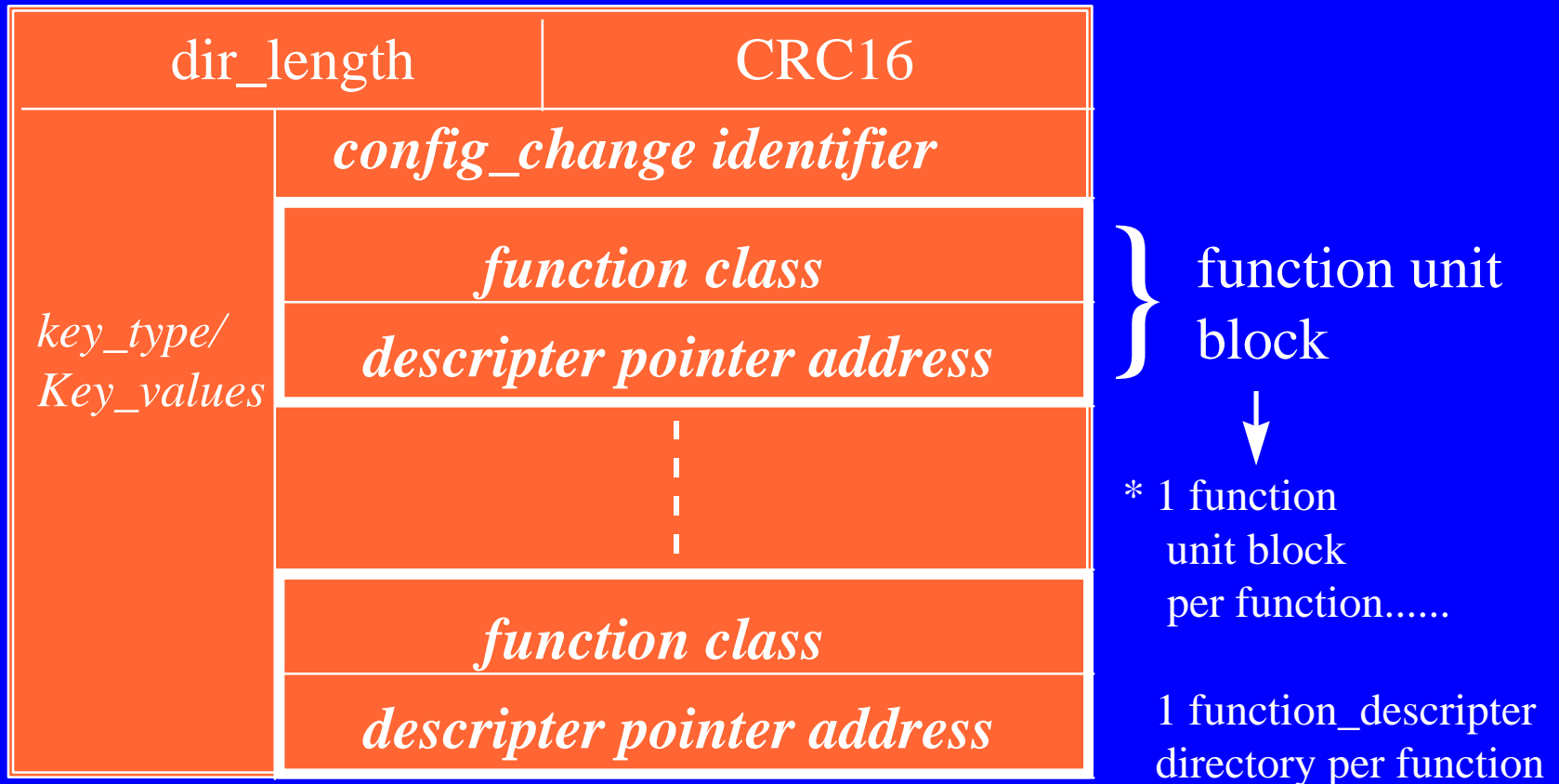
* *fields in **bold italics** are newly defined as 1212 fields*

Function_list directory
-Basic Architecture

dir_length	CRC16

key_type/ Key_values	*config_change identifier*
	function class
	descripter pointer address
	function class
	descripter pointer address

} function unit block

↓

* 1 function
  unit block
  per function......

1 function_descripter
directory per function

* *fields in* **bold italics** *are newly defined as 1212 fields*

Function_list directory -Field Definition

field	key_value	description
config change identifier	18 h	value of state change random counter
function_unit_class	19 h	function class of function (binary)
descripter pointer address	1A h	pointer address to corresponding Function_descriptor directory

Function_descripter directory -Basic Architecture

dir_length	CRC16

key_type/ Key_values	*p_length*
	function_spec_ID
	function_sw_version
	entry address
	function_unit_info_offset
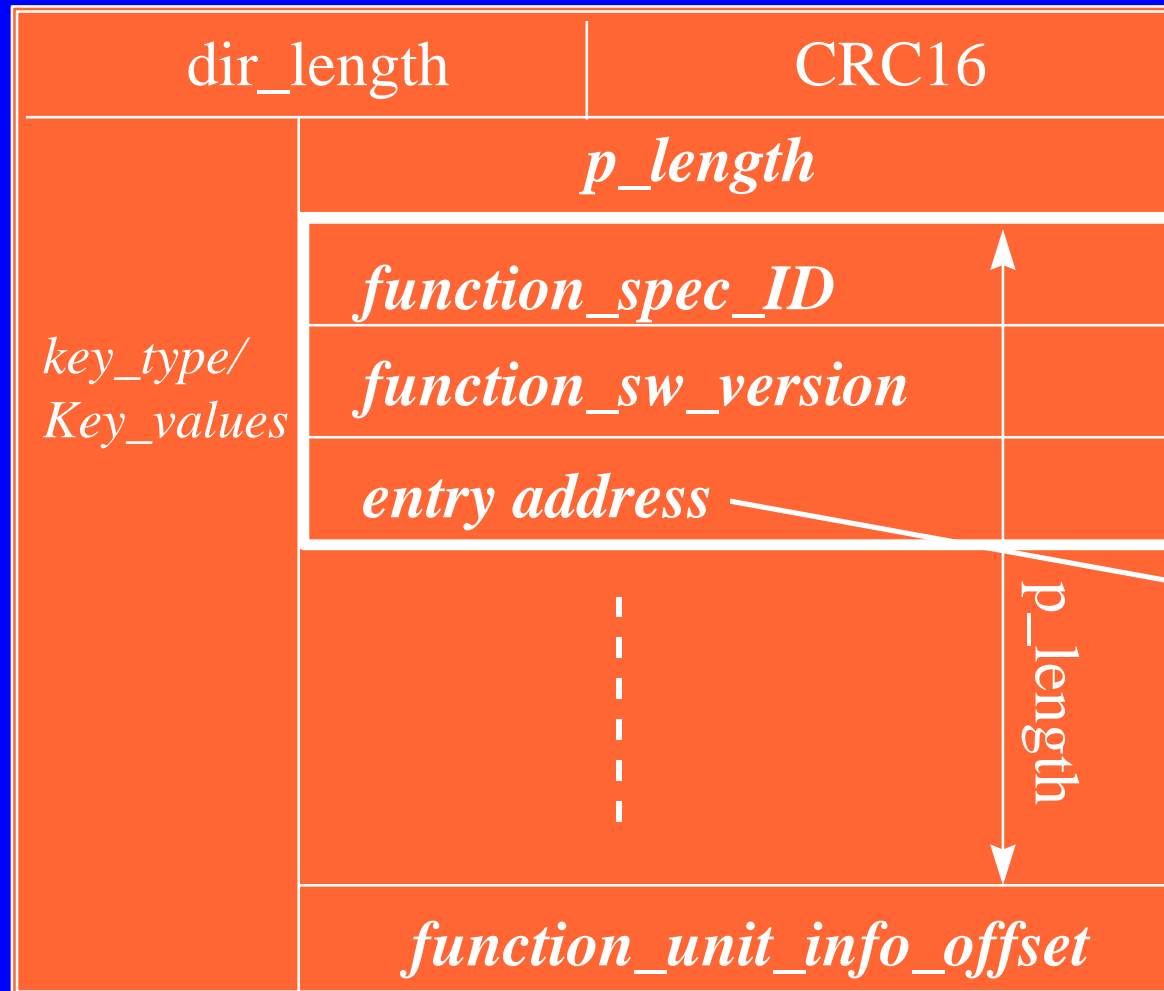
} protocol descriptor block

p_length

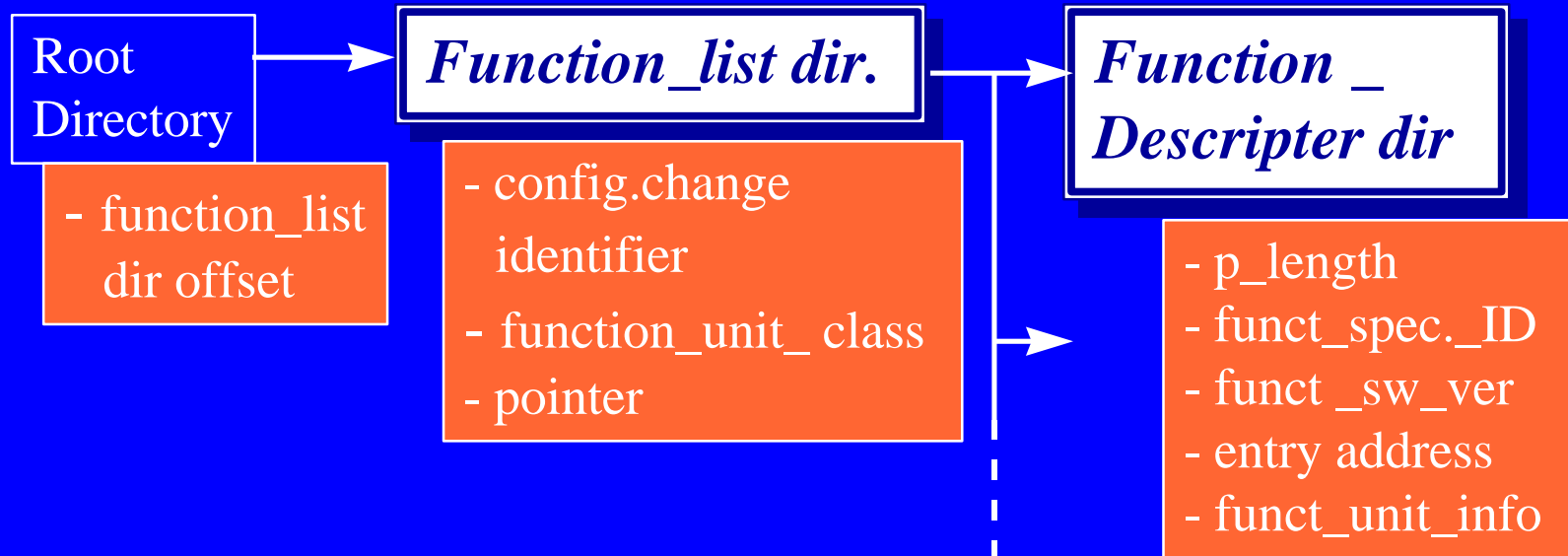Can be used as pointer to entry address of protocol. ...in case Unit_Location does not exist.

** fields in **bold italics** are newly defined as 1212 fields*

Function_descriptor directory -Field Definition

field	key_value	description
p_length	1B h	length of protocol block
function_specID	1C h	spec ID of protocol supported by this function.
function_sw_ver	1D h	sw_version of protocol supported by this function.
entry address	1E h	pointer address to corresponding protocol entry
function_unit _info offset	1F h	pointer address information block of this function

IEEE1212 FDS Summary

Root Directory → *Function_list dir.* → *Function _ Descripter dir*

- function_list dir offset

- config.change identifier
- function_unit_ class
- pointer

- p_length
- funct_spec._ID
- funct _sw_ver
- entry address
- funct_unit_info

Total of:
* **9** new entry field (and key_values)
* **2** new defined directories

       defined as IEEE 1212 underline extension (addition).

       (NO change to current IEEE1212 definitions.)

Issues for Part1(IEEE1212part)

- **Categorization of function unit "types"!**
  - Does any suitable (global) registry exist?
  - Do we make the registery extensible?
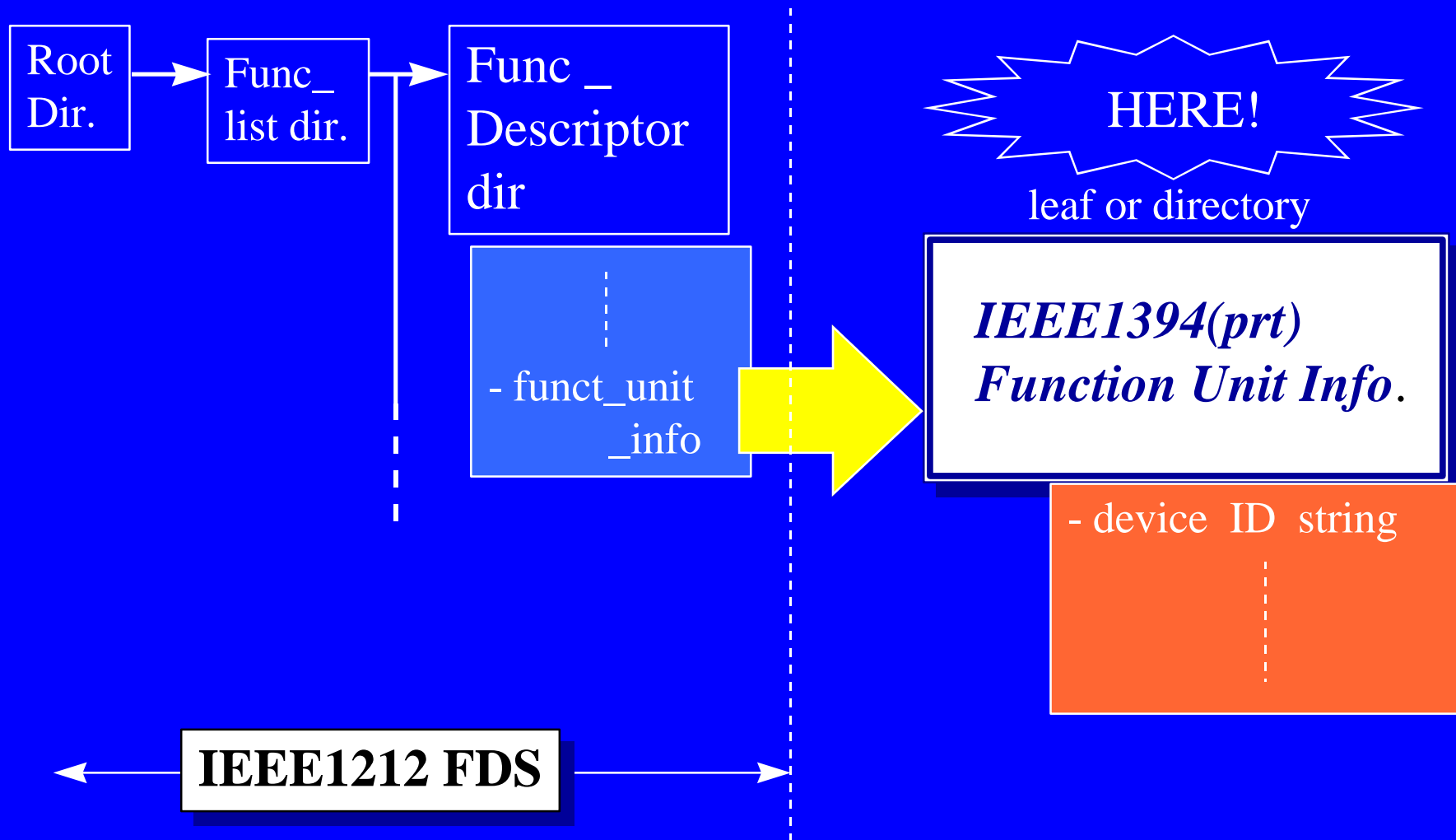 - Do we make the registery bus dependent?

(IEEE1394)

Part 2:
IEEE 1394 (Printer) Function Discovery

Usage of Function_unit Info dir/leaf

- Can store information per function.

- Definition will be 1212-independent
  (must follow 1212 directory/leaf formats)

- Can define printer-specific information
  - Plug and Play strings....OS vendor (participation) issue?
  - Printer information

- Can apply for IEEE1394 (not 1212) key _ value here.
  - "31h - " ? (30h: 1394 power management)

IEEE1394 Function Unit Info

Root Dir.	→	Func_ list dir.	→	Func _ Descriptor dir

- funct_unit _info

HERE!

leaf or directory

IEEE1394(prt) Function Unit Info.

- device ID string

IEEE1212 FDS

Issues for Part2

- Specify Scope (IEEE1394?, IEEE1394prt spec ?)
- List up of contents to be included in this block.
- IEEE1394 printer Plug and Play string definition
    - legacy 1284 device ID strings ?
- Defining minimum required fields

Contact

- ## Proposal document at

  - **ftp://ftp.tokyoweb.or.jp/pwgc1394/pub/**

    proposals/sub-wg/Fds05.pdf

- PWG-C requests this document to become the IEEE1212 function discovery (task) proposal from PWG/PWG-C