



PHPoC

PHPoC vs PHP

Version 1.1

Sollae Systems Co., Ttd.

PHPoC Forum: <http://www.phpoc.com>

Homepage: <http://www.eztcp.com>

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1 Overview

1.1 Overview

PHPoC is programmable language that Sollae Systems has developed. Our all of PHPoC products have PHPoC interpreter in firmware. PHPoC is based on a wide use script language PHP. As PHPoC is simple, whoever has seen programmable language once can use it.

There are a few limitations according to embedded systems' characteristic even if PHPoC is basically compatible with PHP. We recommend you to read this paper before using the product.

2 Features of PHPoC (Differences from PHP)

2.1 Basic Grammar

2.1.1 Comment

Not support for #, single line comment.

2.2 Types

2.2.1 Booleans

String "0" will be not FALSE but TRUE when being converted to Boolean.

2.2.2 Integers

Integer max value is about 9.2×10^{18} in PHPoC.

2.2.3 Classes

Not support for classes.

2.2.4 Arrays

Features are as follows:

- Initial value should be made to declare.
- Only number is acceptable to KEY value.
- Not support for array generation or functional call with a square bracket.

- Examples

Ex1	<pre>\$var0 = array(3, 7, "array", "test"); \$int0 = \$var0[0] + \$var0[1]; \$str0 = \$var0[2] . " " . \$var0[3];</pre>
Ex2	<pre>\$int0 = 3; \$int1 = 7; \$str0 = "array"; \$str1 = "test"; \$var1 = array(\$int0, \$int1, \$str0, \$str1);</pre>
Ex3	<pre>\$str0 = "array test"; \$str0[6] = "T"; \$str0[7] = "E"; \$str0[8] = "S"; \$str0[9] = "T"; echo \$str0; // Output: array TEST</pre>

2.2.5 Null

Not support for Null.

2.2.6 Type Juggling

- Arithmetic Operator: addition(+), subtraction(-), multiplication(*), division(/)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	O	X
Floating Point	X	O	O	X
String	X	X	X	X

- Arithmetic Operator: the rest (%)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	X	X
Floating Point	X	X	X	X
String	X	X	X	X

- Bitwise Operator: AND(&), OR(|), XOR(^), left shift(<<), right shift(>>)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	X	X
Floating Point	X	X	X	X
String	X	X	X	X

- Bitwise Operator: compliment(~)

Boolean	Integer	Floating Point	String
X	O	X	X

- Comparison Operator:

less than(<), greater than(>), less or equal(<=), greater or equal(>=)

Types	Boolean	Integer	Floating Point	String
Boolean	X	X	X	X
Integer	X	O	O	X
Floating Point	X	O	O	X
String	X	X	X	O

- Comparison Operator: equal(==), not equal(!=), not equal(<>)

Types	Boolean	Integer	Floating Point	String
Boolean	O	X	X	X
Integer	X	O	X	X
Floating Point	X	X	O	X
String	X	X	X	O

- Increment/Decrement Operator: increment(++), decrement(--)

Boolean	Integer	Floating Point	String
X	O	X	X

- Logical Operator: AND(&&), OR(||)

Types	Boolean	Integer	Floating Point	String
Boolean	O	O	X	O
Integer	O	O	X	O
Floating Point	X	X	X	X
String	O	O	X	O

- Logical Operator: NOT(!)

Boolean	Integer	Floating Point	String
O	O	X	O

- Sign Operator: positive(+), negative(-)

Boolean	Integer	Floating Point	String
X	O	O	X

- Expression in Control Structure: if, for, (do) while

Boolean	Integer	Floating Point	String
O	O	X	O

- printf function output format

Types	Boolean	Integer	Floating Point	String
%b, %o, %x	X	O	X	X
%d, %u	X	O	X	X
%c	X	O	X	X
%e, %f, %g	X	X	O	X
%s	X	X	X	O

2.3 Variables

2.3.1 Variables Definition

Initial number should be given when you declare variables. You cannot declare more than 2 variables in single line.

☞ **Max size of variable's name is 32 bytes. If it is over limited length, the rests are ignored.**

2.3.2 Variable Variables

Not support for variable variables.

2.4 Constants

2.4.1 Constants Definition

Not support for declaring constants with 'const' keyword.

2.4.2 Variable String Constants

Not support for variable string constants.

2.4.3 Predefined Constants

PHPoC provides several predefined constants. Refer to appendix for more details.

2.5 Operators

2.5.1 Operator Precedence

Precedence	Operator Mark	Operators
High Low	[(Parenthesis
	++ -- ~ (int) (string) (bool)	Types /Increment /Decrement
	!	Logical
	* / %	Arithmetic
	+ - .	Arithmetic
	<< >>	Bitwise
	< <= > >=	Comparison
	== != === !== <>	Comparison
	&	Bitwise
	^	Bitwise
		Bitwise
	&&	Logical
		Logical
	? :	Ternary
	= += -= *= /= .= %= &= = ^= <<= >=	Assignment

2.5.2 Arighmetic Operators

The result of arithmetic operations between integers is always integer at PHPoC.

PHPoC	PHP
<pre>\$a = 3; \$b = 2; echo \$a / \$b; // Output: 1(Integer)</pre>	<pre>\$a = 3; \$b = 2; echo \$a / \$b; // Output: 1.5</pre>

2.5.3 Error Control Operators

Not support for error control operators.

2.5.4 Excecuton Operators

Not support for execution operators.

2.5.5 Logical Operators

Logical operators only accepts mark ('!', '&&', '||' and '^') and never accepts letter (NOT, AND, OR, and XOR).

2.5.6 Array Operators

Not support for array operators (Union, Equality, Identity and etc.).

2.6 Control Structures

2.6.1 Control Structure

Not support for control structure as follows.

- foreach, declare, require, require_once, goto and label

2.6.2 Alternative Syntax for Control Structures

Not support for any alternative syntax for control structure (':', endif, endwhile and etc.).

2.6.3 Switch

It is not acceptable to use ';' (semicolon) instead of ':' (colon) after case expression of switch statement.

2.7 Functions

2.7.1 Funtion Definition

PHPoC has to declare first before calling, otherwise PHP can call function before declaring.

2.7.2 Function Arguments

- It is not allowed to use duplicated argument names in a user-defined function.

2.7.3 Returning Values

- If there is no returning values, user-defined function is returning zero (0) instead of NULL.
- Not support for returning by reference.

2.7.4 Variable Functions

Not support for variable functions.

2.7.5 Anonymous Functions

Not support for anonymous functions.

2.7.6 Internal Functions

PHPoC is supporting for various internal functions. Refer to a document named PHPoC Internal Functions about how to use those functions.

2.8 Namespaces

2.8.1 User-defined Namespaces

Not support for User-defined Namespaces.

2.8.2 Namespace Sharing

Keywords, functions and constants share namespaces. Be careful not to make the same name of those when you create them.

3 Appendix

3.1 Predefined Constants

PHPoC provides predefined constants as following below.

Name	Description	Value
COUNT_NORMAL	Normal Counting for one-dimension array	0
COUNT_RECURSIVE	Recursive Counting for multi-dimension array	1
EPIPE	Broken Pipe, Returning as connection is broken while sending TCP data	32 (0x20)
EBUSY	Device or Resource Busy	16 (0x10)
FALSE	False	0
M_PI	Pi	≐ 3.141592653589793
M_E	Euler's Constant	≐ 2.718281828459045
MAX_STRING_LEN	Max string variable length	1,534
PHP_VERSION_ID	PHPoC Version	-
SEEK_SET	File pointer position: at the beginning of file	0
SEEK_CUR	File pointer position: current position of file	1
SEEK_END	File pointer position: at the end of file	2
SSL_CONNECTED	SSL status: connected	19 (0x13)
SSL_CLOSED	SSL status: not connected	0
SSL_LISTEN	SSL status: wait for connection	1
TRUE	True	1
TCP_CLOSED	TCP status: not connected	0
TCP_LISTEN	TCP status: wait for connection	1
TCP_CONNECTED	TCP status: connected	4

3.2 Keyword

This table below shows predefined keywords in PHPoC. As keywords, functions and constants share namespace, try not to use duplicated names with those keywords when creating functions or constants.

Predefined Keywords					
a	array()	d	do	i	include
b	bool	e	echo	p	include_once
	boolean		else		print
	break		elseif	r	return
c	case	g	exit()	s	static
	const		global		string
	continue		goto		switch
d	default	i	if	w	while
	define		int		
	die()		integer		

3.3 Restriction about Memory

- Number of Variables

PHPoC is limited memory size so does memory for using variables. Thus, both the number of variables and the length of string variables are limited. The max number for variable creation is in inverse proportion to the size of variables.

3.1 Error Messages

PHPoC prints various error messages out for debugging by console.

Error Messages
address already in use
argument count mismatch
cannot break/continue N level(s)
'case' or 'default' expected
device or resource busy
divided by zero
duplicated name
expression syntax error
file name too long
file not found
integer number too large
invalid argument
invalid constant name
invalid device or address
maximum execution time exceeded
missing operator
missing terminating character ''' or ''''
modifiable value required
only variable can be passed by reference
operation not permitted
out of memory
string too long
syntax error
syntax error, unexpected array [, expecting 'token']
syntax error, unexpected character
syntax error, unexpected 'character' [, expecting 'character']
syntax error, unexpected end of file
syntax error, unexpected 'name' [, expecting 'character']
syntax error, unexpected number [, expecting 'character']
syntax error, unexpected 'operator' [, expecting 'token']
syntax error, unexpected string [, expecting 'character']
syntax error, unexpected 'token' [, expecting 'token']
syntax error, unexpected variable [, expecting 'character']
too many open files
undefined name
undefined offset
unsupported argument type
unsupported operand type
unsupported operator
unsupported pid
unsupported type juggling
'while' expected

4 Revision History

Date	Version	Note	Author
2014.09.23	1.0	○ Created	Roy LEE
2014.12.22	1.1	○ Add a predefined constant(PHP_VERSION_ID)	Roy LEE