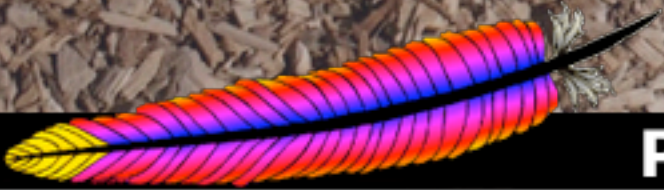


A gentle introduction to APR

colm,davi,pquerna

Apache

Portable Runtime Project

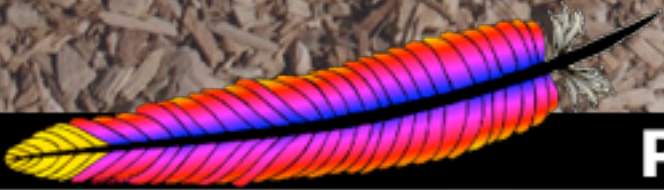


What does APR do?

- Portability runtime
 - C library with portable routines accross Windows, *nix, Netware, OS/2, Nokia, more ...
 - apr-util is a utility library that runs on top of APR
 - a memory management library

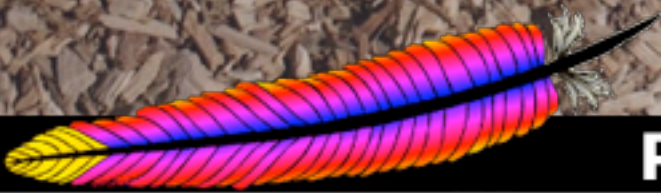
Apache

Portable Runtime Project



What does APR not do?

- Does not attempt to replace existing portable calls, the standard library still exists.
- Is not a run-anywhere or a VM.



Hello World

```
#include "apr.h"
#include "apr_file_io.h"
#include <stdlib.h> /* For atexit() */

int main(int argc, char *argv[])
{
    apr_pool_t *p;
    apr_file_t *fp;
    apr_initialize();
    atexit(apr_terminate);
    apr_pool_create(&p, NULL);
    apr_file_open_stdout(&fp, p);
    apr_file_printf(fp, "Hello World" APR_EOL_STR);
    return APR_SUCCESS;
}
```



Apache

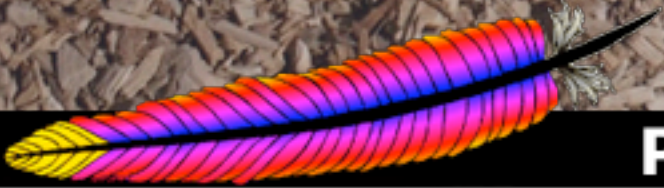
Portable Runtime Project

Hello World

```
gcc `apr-1-config --includes` \
  --cflags --cppflags --link-ld --libs` \
  -o helloworld helloworld.c
```

Apache

Portable Runtime Project

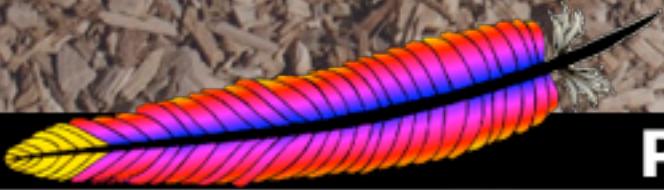


Pools

- Data structure for memory management
- Memory is taken from the pool (no free(), only subpools)
- Pools are typically passed between functions
- Entire pool then freed
 - Not garbage collection
 - No reference counting

Apache

Portable Runtime Project



Pools

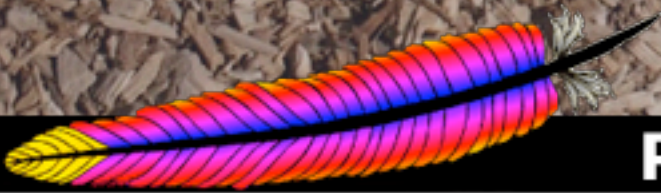
```
apr_pool_create(&pool, NULL);

for (i=0; i < n; ++i) {
    do_something(pool, i);
    data = apr_palloc(pool, 512);
    apr_pool_clear(pool);
}

apr_pool_destroy(&pool, NULL);
```

Apache

Portable Runtime Project

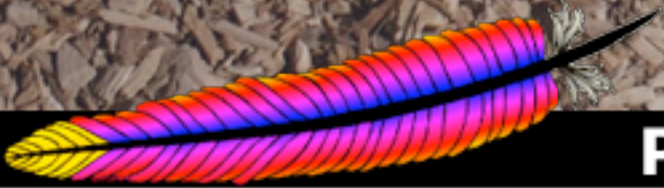


Data structures

- Hashes
- Tables
- Arrays
- Locks
- Rings

Apache

Portable Runtime Project

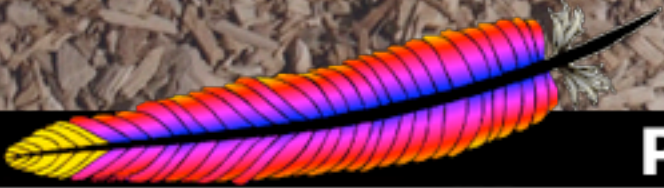


Useful routines

- Checksums
- DBD
- DBM
- Memcache
- Encoding

Apache

Portable Runtime Project

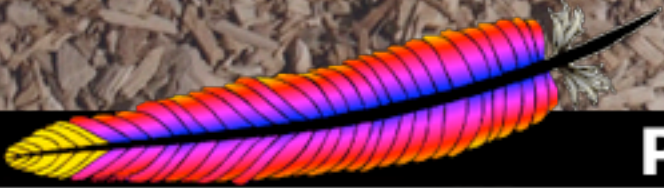


Useful routines

- Hooks
- Dates
- XML Parsing
- URI Parsing
- opening libraries

Apache

Portable Runtime Project

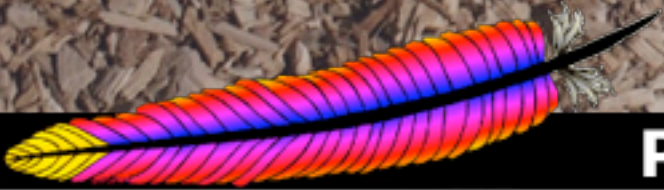


Process Control

- Thread creation and management
- Child creation and management
- Mutexes and Semaphores
- shared memory
- resource lists
- hook functions

Apache

Portable Runtime Project

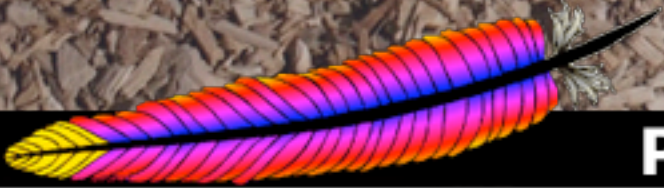


I/O

- Buckets
- Brigades
- sendfile
- mmap
- IP version agnostic and Multicast

Apache

Portable Runtime Project



Questions?

?

Apache

Portable Runtime Project

