LibreSSL

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CeBIT 2015

SNB Information Technology & Web Solutions

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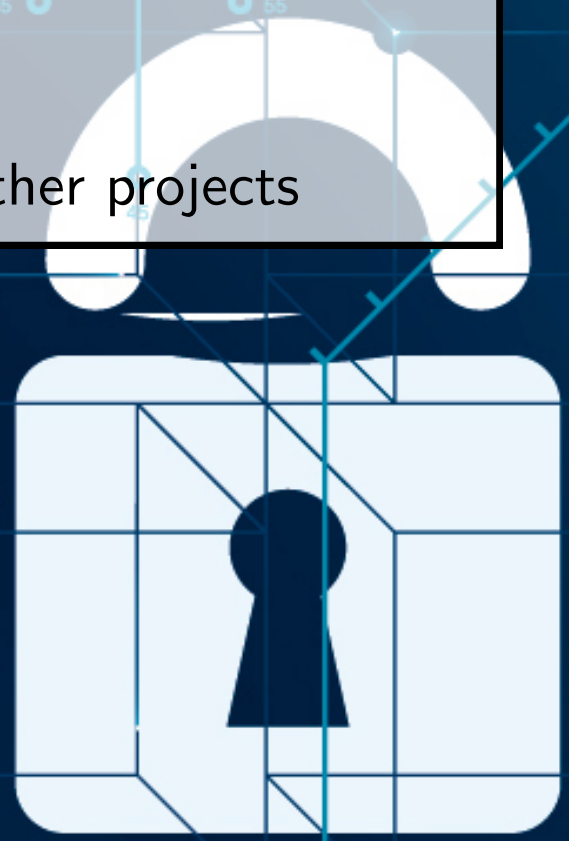

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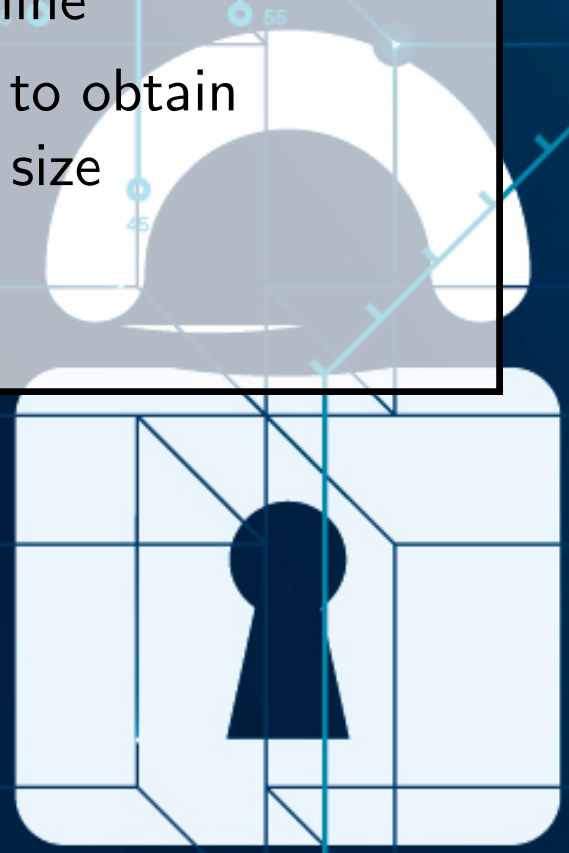

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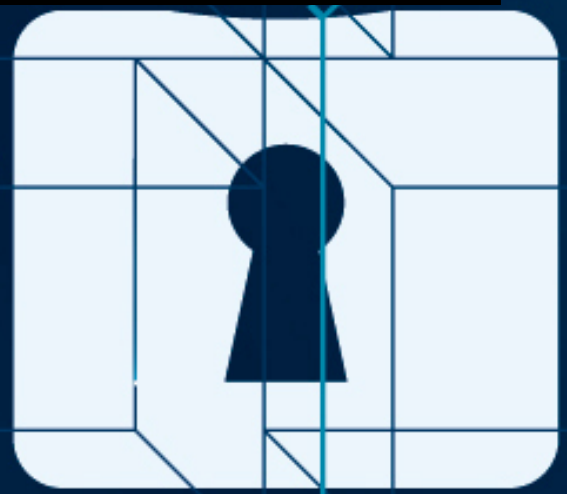
- attack can be repeated many times to obtain different memory allocations of 64k size
- memory stolen could reveal any kind of data: passwords, credit card numbers, personal data, ...

Why Heartbleed happened ?

- code too complex and intricated



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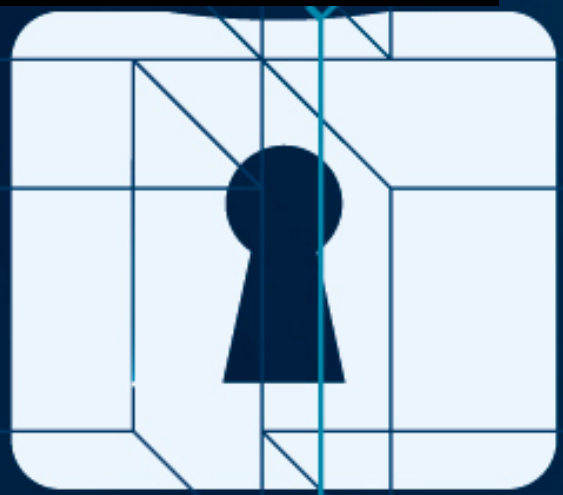

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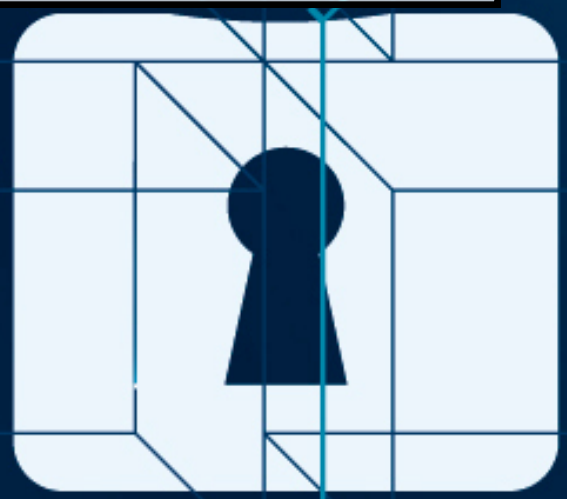

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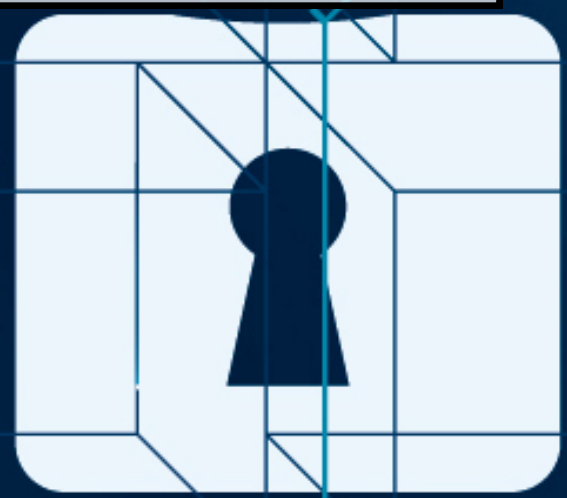
- bugs (and fixes) sleep for years in the bug tracker



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- includes the ability to replace the malloc/free at runtime

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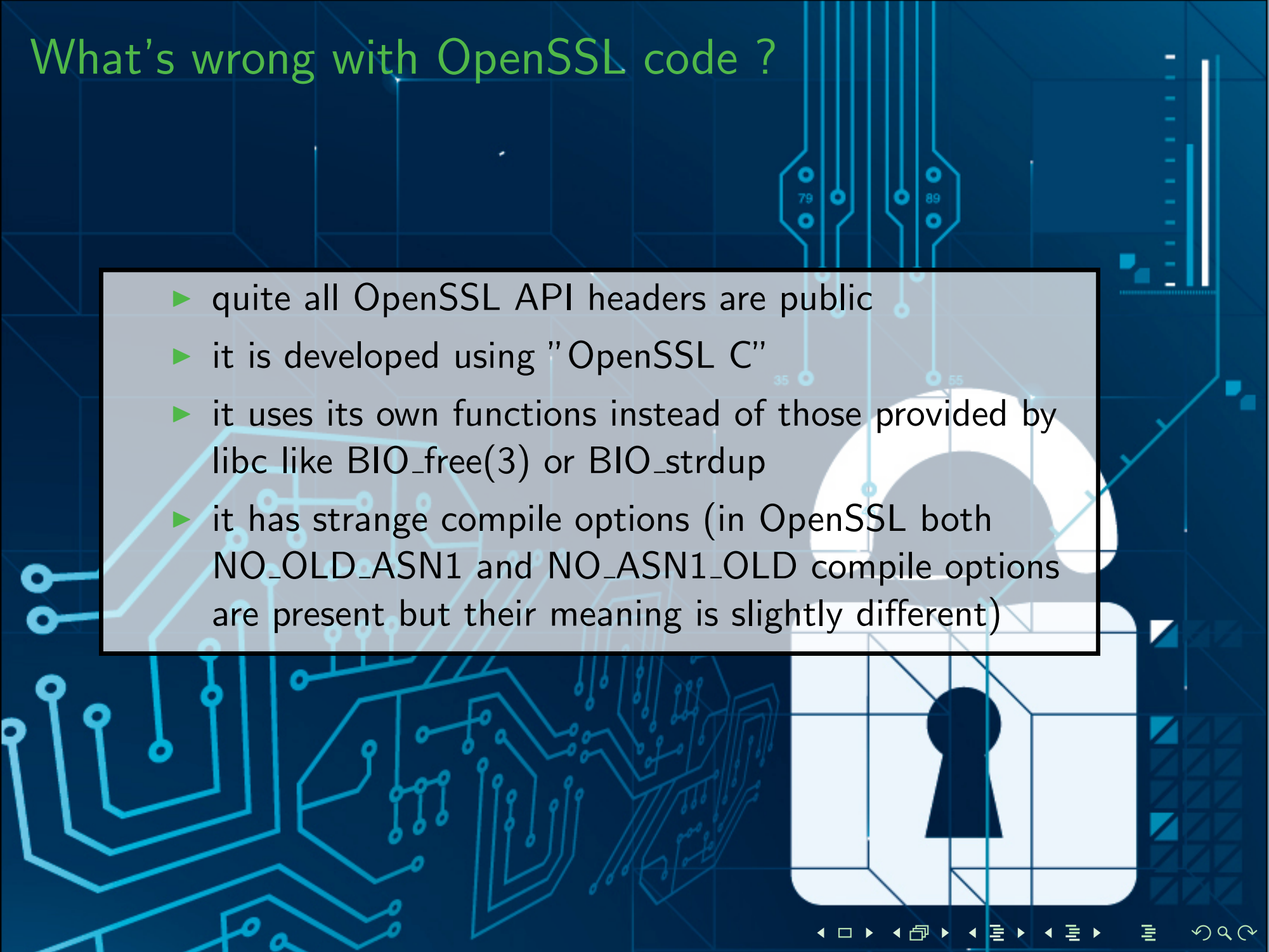
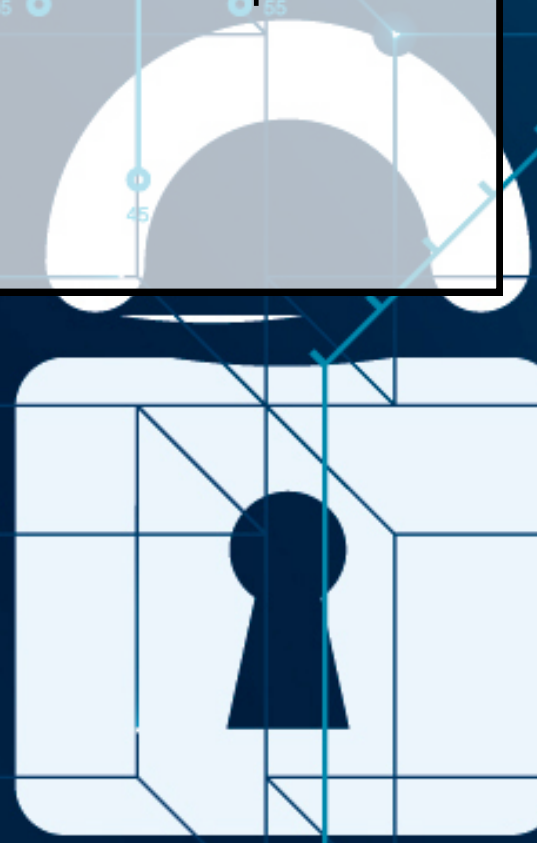
- it has strange compile options (in OpenSSL both NO_OLD_ASN1 and NO_ASN1_OLD compile options are present but their meaning is slightly different)



LibreSSL

- very young project, development started on April 2014



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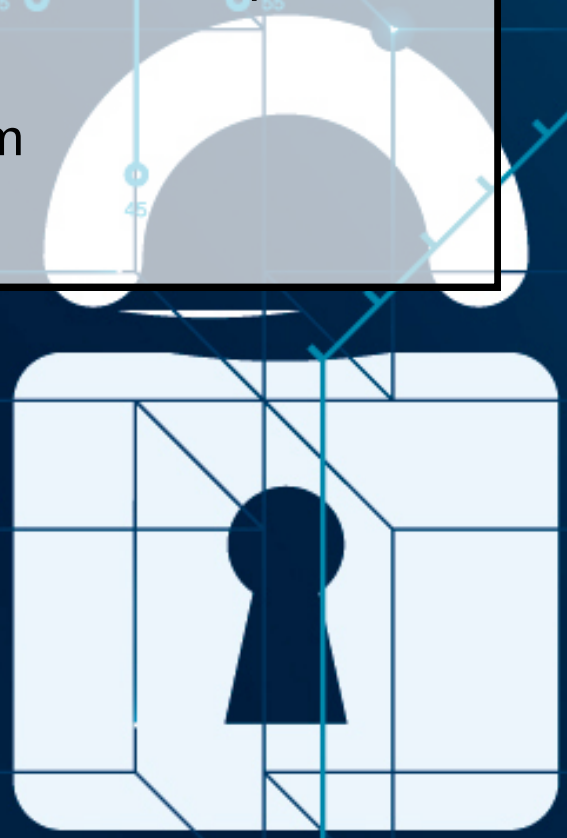

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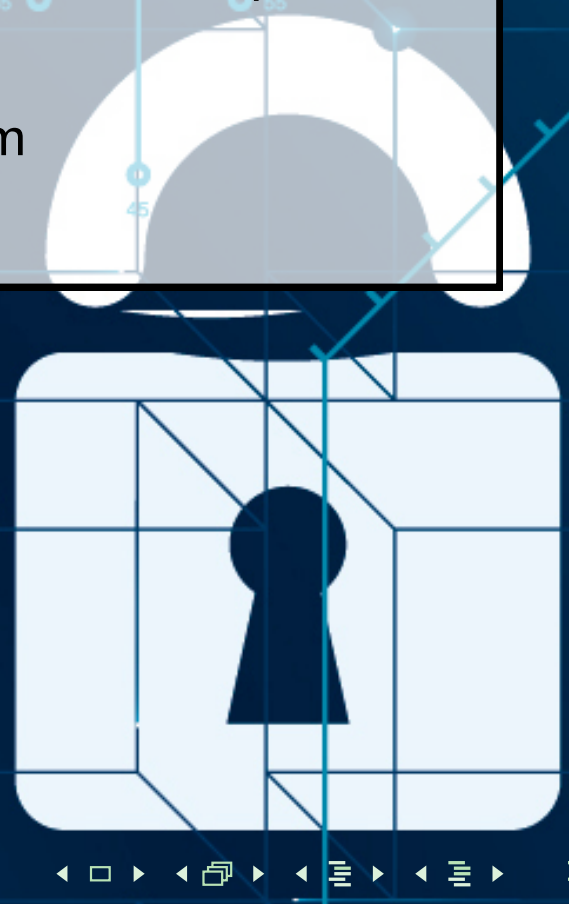

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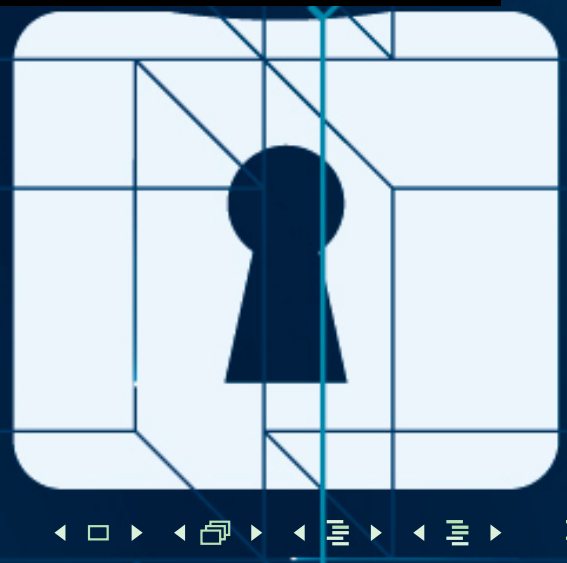

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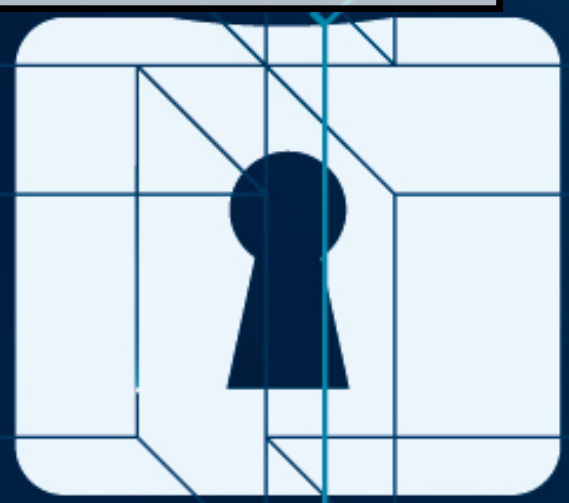

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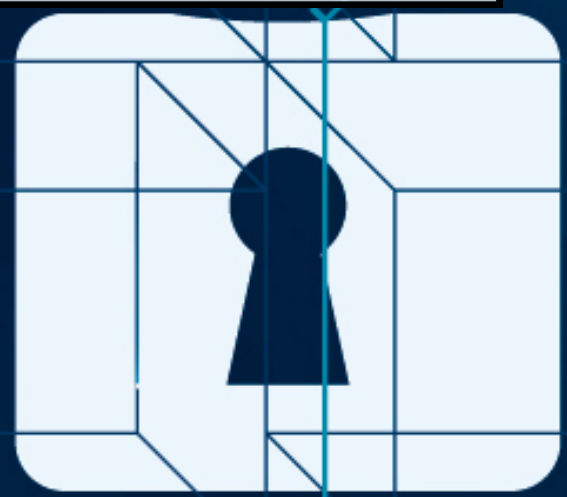

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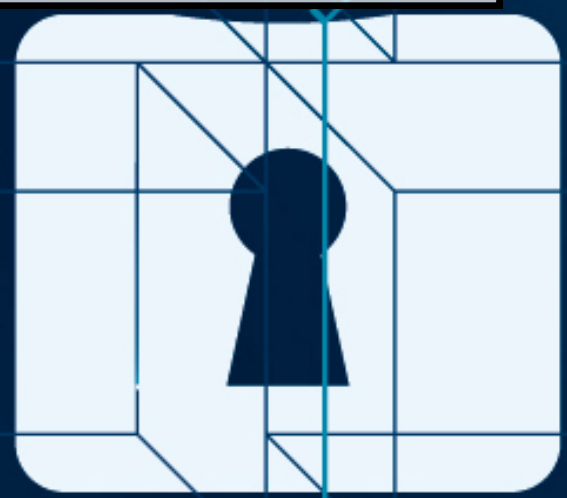

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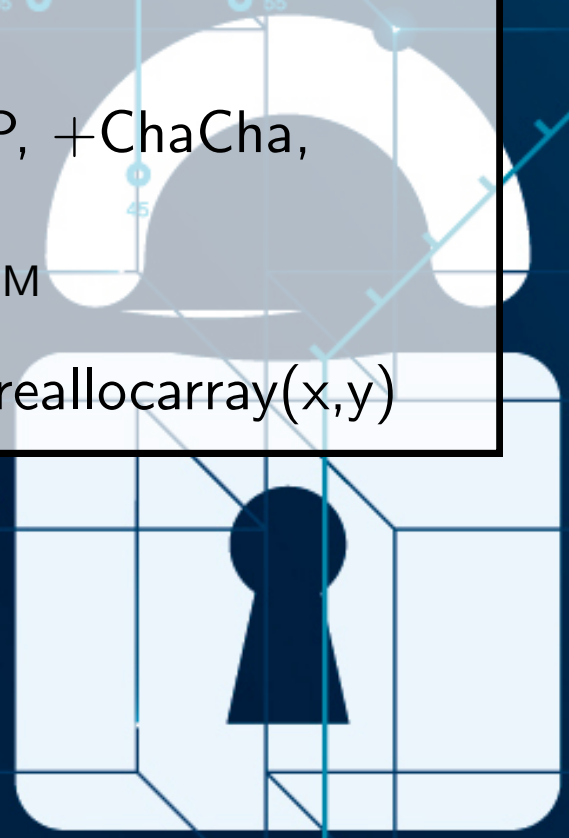
- malloc(x*y) has been converted to reallocarray(x,y)



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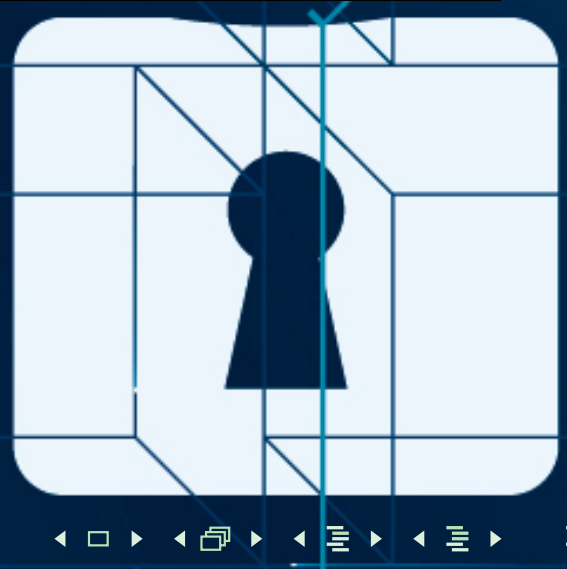

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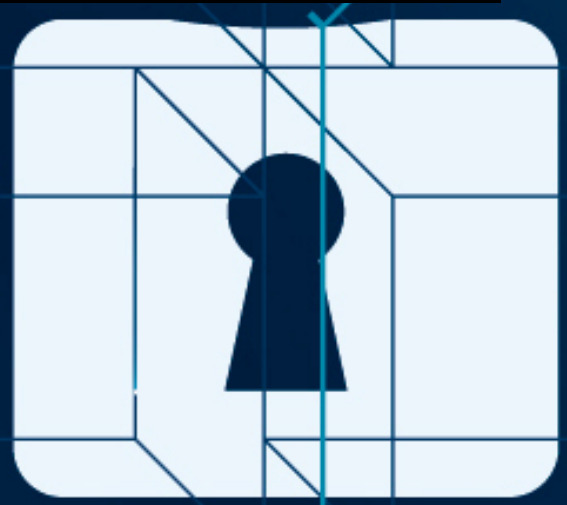

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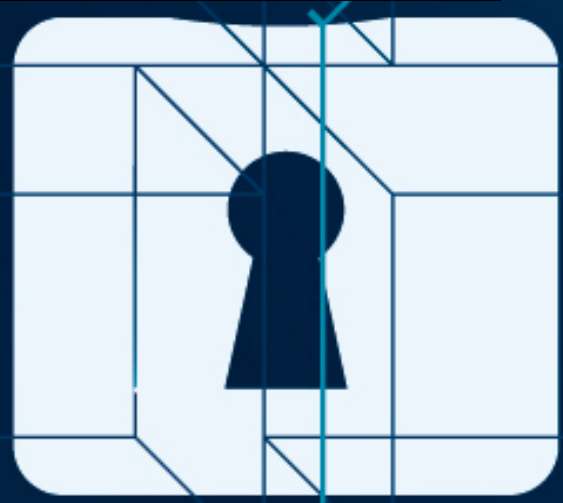
- use and abuse of internal functions that behaves "more or less" the same as libc counterpart
- #ifdef and #ifndef everywhere
- support for as many combinations of operating systems and compilers out there



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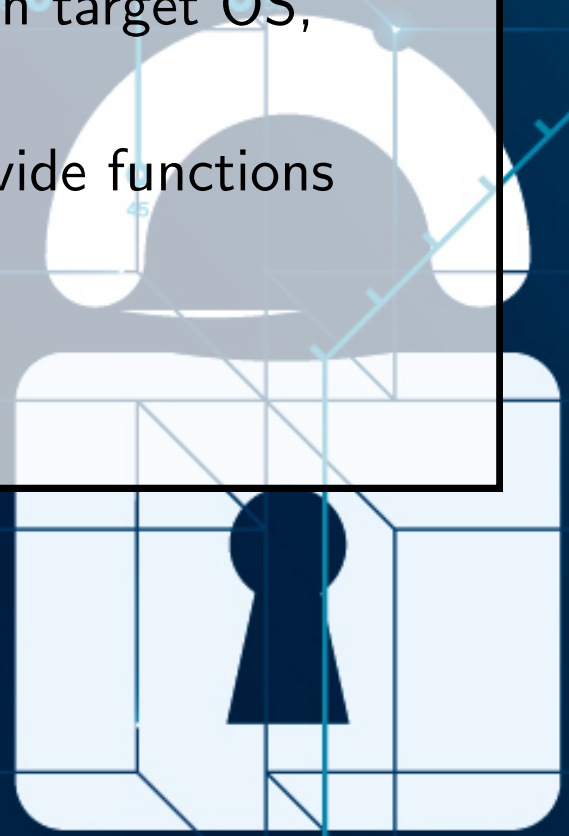

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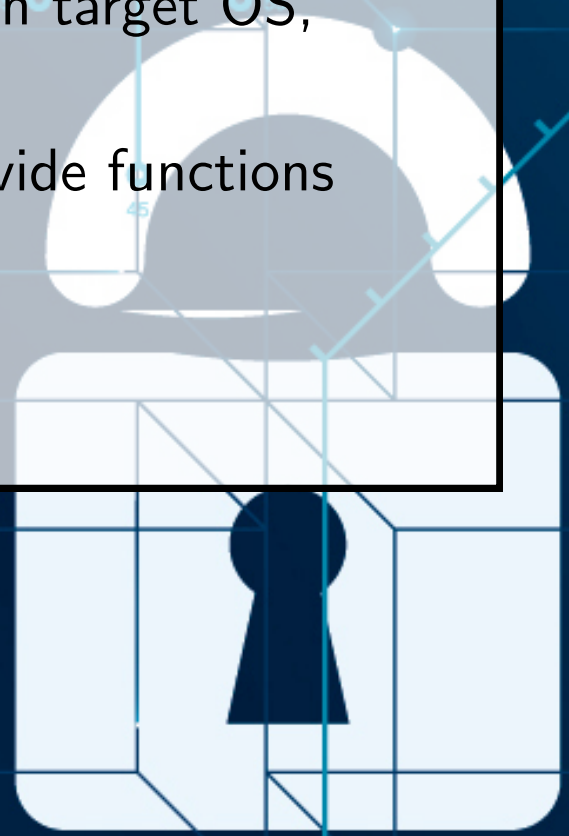

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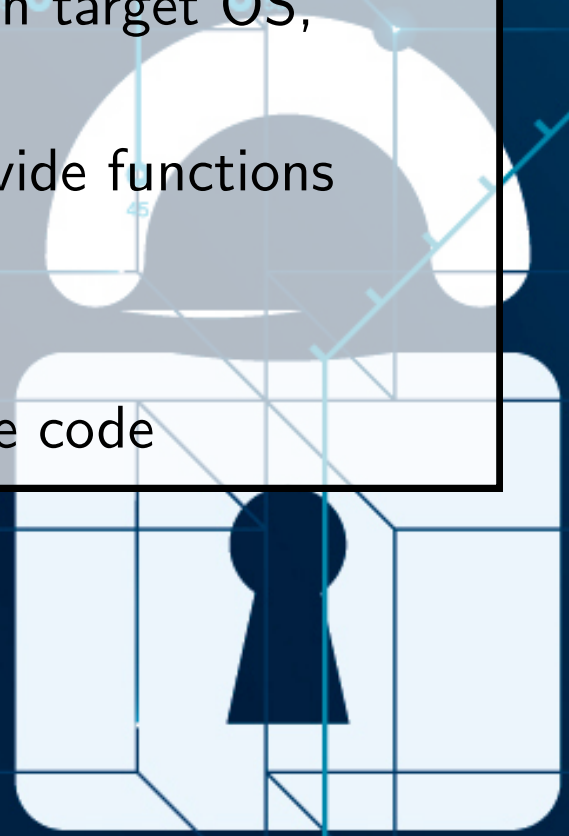
- put as few #ifdefs as possible in the code



LibreSSL API, ftp client

```
-               if (inet_pton(AF_INET,  host, &addrbuf) != 1 &&
-                   inet_pton(AF_INET6, host, &addrbuf) != 1) {
-                       if (SSL_set_tlsext_host_name(ssl, host) == 0) {
-                               ERR_print_errors_fp(ttyout);
-                               goto cleanup_url_get;
-                       }
-               }
-               if (SSL_connect(ssl) <= 0) {
-                       ERR_print_errors_fp(ttyout);
+               if (ressl_connect_socket(ssl, s, host) != 0) {
+                       fprintf(ttyout, "SSL failure: %s\n", ressl_error(ssl));
                        goto cleanup_url_get;
                }
-               if (ssl_verify) {
-                       X509    *cert;
-
-                       cert = SSL_get_peer_certificate(ssl);
-                       if (cert == NULL) {
-                               fprintf(ttyout, "%s: no server certificate\n",
-                                   getprogname());
-                               goto cleanup_url_get;
-                       }
-
-                       if (ssl_check_hostname(cert, host) != 0) {
-                               X509_free(cert);
-                               fprintf(ttyout, "%s: host ‘%s’ not present in"
-                                   " server certificate\n",
-                                   getprogname(), host);
-                               goto cleanup_url_get;
-                       }
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- do not reinvent the wheel
- every bug could be a security bug

Questions ?

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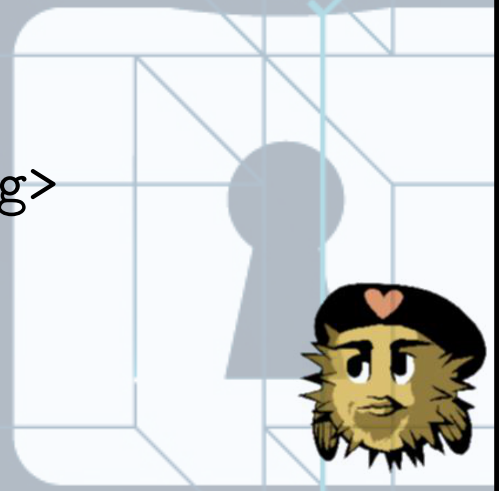

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