POCO C++ Libraries
Introduction and Overview

"Without a good library, most interesting tasks are hard to do in C++; but given a good library, almost any task can be made easy."

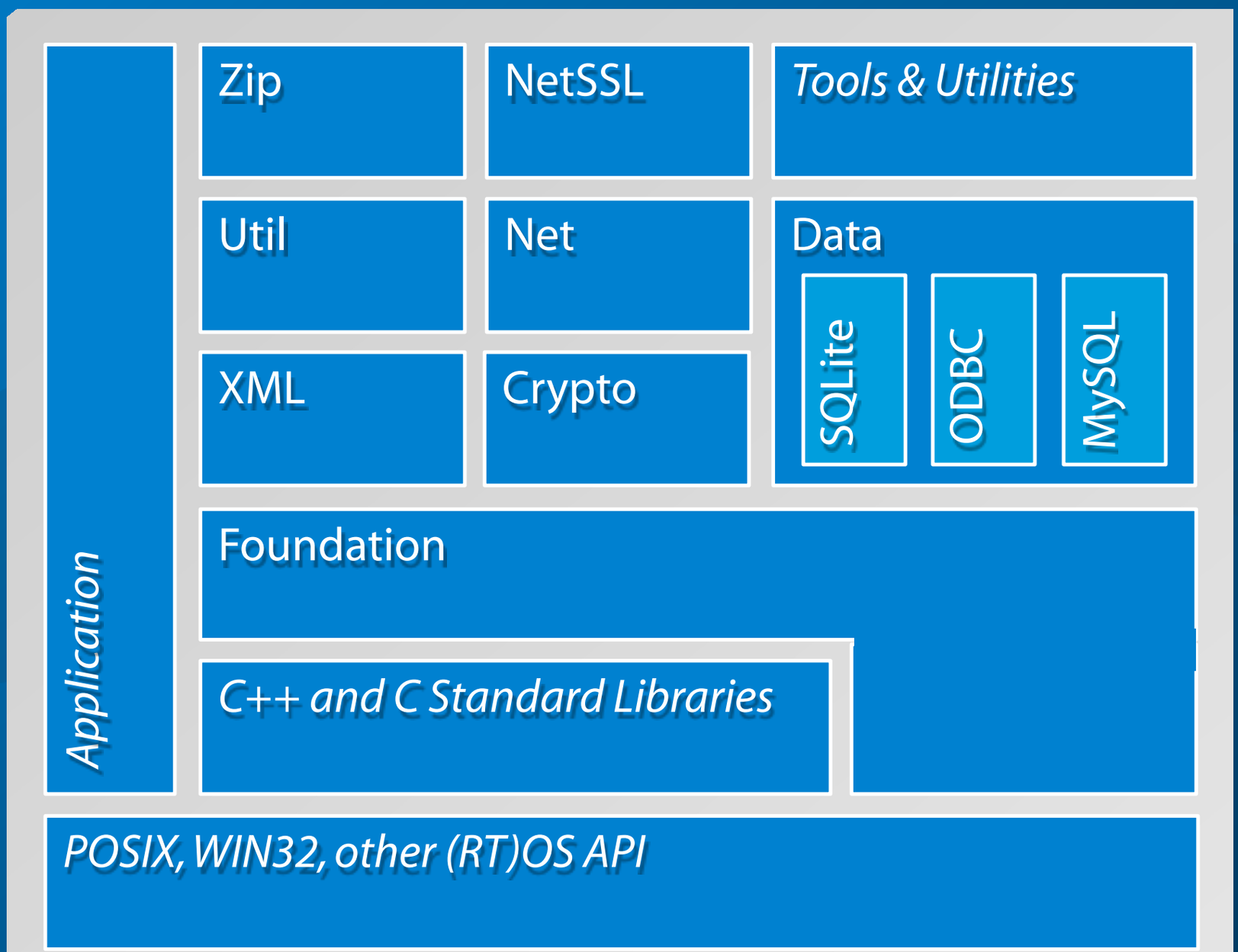
Bjarne Stroustrup

(designer and original implementor of C++)

The POCO C++ Libraries are...

- a collection of C++ class libraries, similar in concept to the Java Class Library, the .NET Framework or Apple's Cocoa;
- focused on "internet-age" network-centric applications;
- written in efficient, modern ANSI/ISO Standard C++ and based on the C++ Standard Library/STL;
- highly portable and available on many different platforms;
- Open Source, licensed under the Boost Software License,
- and thus completely free for both commercial and non-commercial use.

POCO C++ Libraries Overview



Features

- Any and DynamicAny classes
- Cache framework
- Cryptography (cryptographic hashes, encryption based on OpenSSL)
- Date and Time classes
- Events (signal/slot mechanism) and notifications framework
- FTP client for transferring files
- Filesystem classes for platform-independent path manipulation, directory listing and globing
- HTML form handling

Features (cont'd)

- HTTP server and client (also secure), C++ Server Page Compiler
- Logging framework
- Multithreading: basic threads and synchronization and advanced facilities (thread pool, active objects, work queues, etc.)
- POP3 client for receiving mail
- Platform Abstraction: write once, compile and run on multiple platforms
- Processes and IPC
- Reactor framework
- Regular expressions (based on PCRE)

Features (cont'd)

- SMTP client for sending mail
- SQL database access (SQLite, MySQL, ODBC)
- SSL/TLS support based on OpenSSL
- Shared library and class loading
- Smart pointers and memory management (buffer, pool)
- Sockets and raw sockets
- Stream classes for Base64 and HexBinary encoding/decoding, compression (zlib), line ending conversion, reading/writing to memory, etc.

Features (cont'd)

- String formatting and string utilities
- TCP server framework (multithreaded)
- Text encodings and conversions
- Tuples
- URI handling
- UTF-8 and Unicode support
- UUID handling and generation
- XML parsing (SAX2 and DOM) and XML generation
- Zip file manipulation

POCO Objectives and Mission

- POCO is a powerful, yet easy to use platform to build your applications upon
- POCO allows you to build highly portable applications (write once – compile and run anywhere)
- POCO is modular and scalable from embedded to enterprise applications (you only pay for what you use)
- POCO provides consistent, comprehensive and comprehensible programming interfaces
- POCO is written in fast, efficient C++

Objectives and Mission (cont'd)

- POCO favors simplicity over complexity ("as simple as possible, but not simpler")
- POCO aims for consistency in design, coding style and documentation
- POCO emphasizes source code quality, in terms of readability, comprehensiveness, consistency, style and testability
- POCO aims to make C++ programming fun again

Guiding Principles

- Strong focus on **code quality**, **style**, **consistency** and **code readability** –all code must satisfy our coding styleguide (and it works – we frequently get compliments on our code quality)
- Strong focus on tests (automated unit tests with high coverage)
- Favor pragmatic and elegant design over "solving all the worlds problems" (if we can satisfy 95 % of all use cases with an elegant solution, and the remaining 5 % would require an overly complex design, we focus on the 95 %)
- Build on top of solid foundations – use existing proven C libraries (e.g., expat, zlib, PCRE, SQLite) where it makes sense

History

- Summer 2004: Günter Obiltschnig started development
- February 2005: First release on SourceForge
  (Release 0.91 under Sleepycat license)
- May 2005: First contributions by Aleksandar Fabijanic
- January 2006: Release 1.0
- March 2006: Release 1.1
- July 2006: Moved to Boost license, POCO Community Website
- August 2006: Release 1.2
- May 2007: Release 1.3
- July 2010: Stable Release 1.3.7,
  about 20 contributors, used in 100s of projects

Supported Platforms

- Microsoft Windows
- Linux
- Mac OS X
- HP-UX, Solaris, AIX*
- Embedded Linux (uClibc, glibc)
- iOS
- Windows Embedded CE
- QNX

* requires patches

POCO Usage Examples

- building automation middleware and devices
- industrial automation and industrial equipment
- traffic control systems
- healthcare applications
- measurement, data acquisition and test systems
- consumer electronics/home automation
- smart metering
- air traffic management systems
- VoIP
- ticketing and entrance-control systems
- shrink-wrapped applications

Some Companies using POCO

- **454 Life Sciences (Roche)**
  using POCO in a new high-speed genome sequencer
- **ACTIA Automotive**
  using POCO and OSP in automotive diagnostic systems
- **Appcelerator Titanium**
  using POCO in its platform for Web-based desktop applications
- **CACE Technologies**
  using POCO in its Pilot product for network monitoring/analysis
- **CodeLathe Tonido**
  using POCO in its Tonido web application platform and device

Some Companies using POCO (cont'd)

- **Comact Optimisation**
  using POCO in sawmill equipment running under QNX **Echo**^{360} (EchoSystem)
  using POCO in a distributed learning platform
- **HORIBA**
  using POCO in automotive test systems
- **Novonics Corporation**
  using POCO in a distributed simulation library used by US DoD and DHS customers
- **Nucor Steel**
  using POCO in beam mill automation applications

Some Companies using POCO (cont'd)

- **Schneider Electric Buildings Business (TAC)**
  using POCO in new building automation platform (running on Embedded Linux devices and Windows/Linux servers)
- **StreamUnlimited**
  using POCO in embedded applications for TV set-top boxes
- **Starticket**
  using POCO in a ticketing/entrance control system running on an embedded Linux (OpenEmbedded on XScale) platform

POCO – Scalability Embedded

- POCO is well-suited for embedded systems running under Embedded Linux, Windows Embedded CE or QNX.
- POCO-based applications (using the built-in web server) run on 75 MHz ARM9-based Linux systems (uClibc) with 8 MB RAM and 4 MB Flash (e.g. Digi Connect ME 9210).
- A typical POCO-based application using the web server from the Net library has a statically linked size of 2 MB and uses about 2 – 3 MB of RAM.

- Typical mid-ranged embedded platforms (32 – 64 MB RAM, 16 – 64 MB Flash, 180 MHz ARM9) provide plenty of resources even for more complex applications (using OSP and Remoting).

POCO and Embedded – Code Size

- POCO (including SSL/Crypto) libraries use less than 4 MB of Flash storage (compressed jffs2 or squashfs).
- The RAM overhead for such an application is below 8 MB.

```
guenter@cis-digiel:~/ws/poco-1.3$ ls -l lib/Linux/armv5tejl/*.so.*
-rwxr-xr-x 1 guenter guenter  103752 2009-03-03 19:12 lib/Linux/armv5tejl/libPocoCrypto.so.6
-rwxr-xr-x 1 guenter guenter 1582720 2009-03-03 18:43 lib/Linux/armv5tejl/libPocoFoundation.so.6
-rwxr-xr-x 1 guenter guenter  907192 2009-03-03 18:47 lib/Linux/armv5tejl/libPocoNet.so.6
-rwxr-xr-x 1 guenter guenter  293960 2009-03-03 19:11 lib/Linux/armv5tejl/libPocoNetSSL.so.6
-rwxr-xr-x 1 guenter guenter  281048 2009-03-03 18:45 lib/Linux/armv5tejl/libPocoUtil.so.6
-rwxr-xr-x 1 guenter guenter  577588 2009-03-03 18:44 lib/Linux/armv5tejl/libPocoXML.so.6
-rwxr-xr-x 1 guenter guenter  353312 2009-03-03 18:54 lib/Linux/armv5tejl/libPocoZip.so.6
```

POCO Benefits & Features

- Comprehensive, complete and mature C++ frameworks that save lots of work and help bringing the product to market sooner.
- Easy learning curve through intuitive, consistent and comprehensible programming interfaces, lots of sample code and good documentation.
- Native C++ code performance (no VM overhead, etc.), low memory requirements.
- Platform independence: write once – compile and run everywhere.
- In many cases, a large part of an application (everything that does not need access to specific hardware) can be tested and debugged on the development host.
- An application can be easily ported to a new platform.

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