

parc[®]
A Xerox Company

CCNxCon Software

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Software Goals

Illustrate and Exemplify the CCN Protocols.

A reference implementation for the CCN protocol specifications.

Packet formats, semantics...

Application protocols, Manifests, ...

Provide a Platform for New Research and New Development.

CCN enables more than just doing old things in a new-fangled way.

Software Expectations

This is Work-In-Progress.

Expect changes to the functionality, the APIs, even behavior.

Changes will come from use, reuse, experimentation.

Changes will result in new releases.

Ideally Change = Progress

Don't Panic!

If something is not implemented,

it doesn't mean that it's not important.

— It just means it's not finished.

Software Principles

Modular

Write simple parts connected by clean interfaces

Clarity

Clarity is better than cleverness

Transparency

Inspection, debugging, measurement

Predictable

Always do the least surprising thing

Fail fast

Fail noisily and as soon as possible

Extensible

Design for the future — it will be here faster than you think

Data Driven

Put knowledge into data, not program logic

Software Requirements

Consistent code style

Strunk and White for source code

Consistent naming

Reduce coupling

Consistent organization

Stop hunting

Clarity trumps cleverness

Must be easy to understand

Single responsibility

“You’ve got one job....”

Extension not modification

Build upon existing facilities, don’t modify them.

Substitutable implementations

Reduce coupling, increase cohesion

Task specific interfaces

....vs large, general purpose, omnibus APIs

Dependency inversion

Write to interfaces, not specific implementations

General Overview

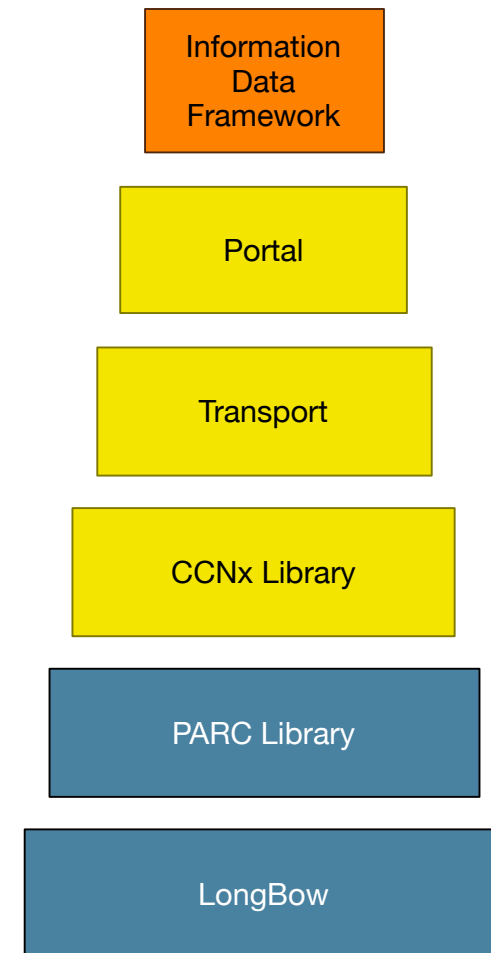
Layered Software Stack

Foundation

CCNx Core

Application Programming Interfaces

Reference “down” never “up”



PARC Foundation: LongBow

LongBow

Debugging and code visibility.

Programming contract enforcement.

Code metrics measurement and evaluation.

Native C language unit testing.

PARC Foundation: Libparc

Libparc

PARC Object - reference counted objects in C

Data structures - Lists, maps, queues

Concurrency - Atomic values, barriers, lock-free primitives

Developer Aids - “Safe” memory, runtime examination

CCNx Library

Libccnx

Bridges CCN specifications to CCN implementations

Programmatic representations of:

Name, Interest, Content Object

Independent of packet formats.

Support the basic messaging and chunked protocols.

Transport

Transport Framework

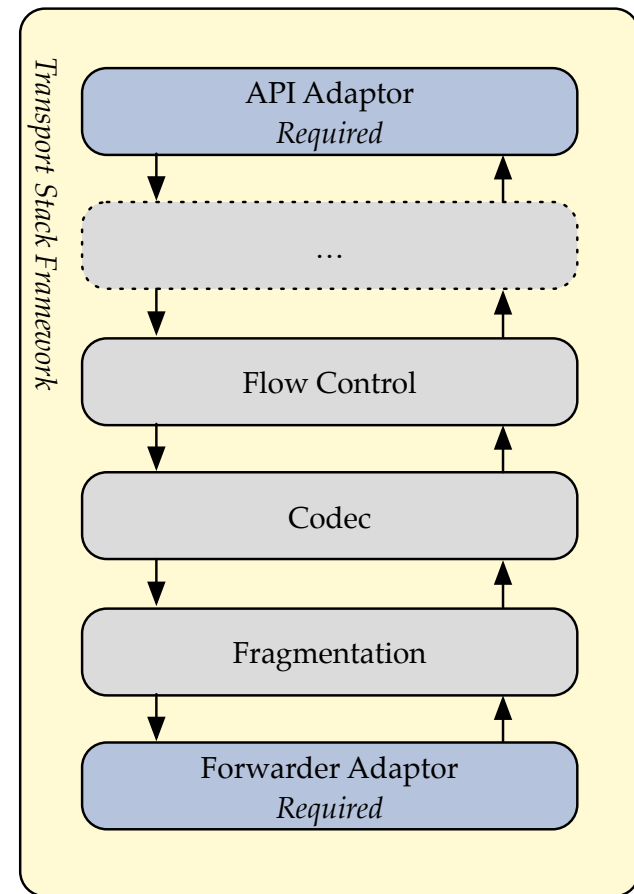
Builds and manages stacks

Transport Stacks

Provides basic protocols

Blocking/Non-blocking

Message/Chunked



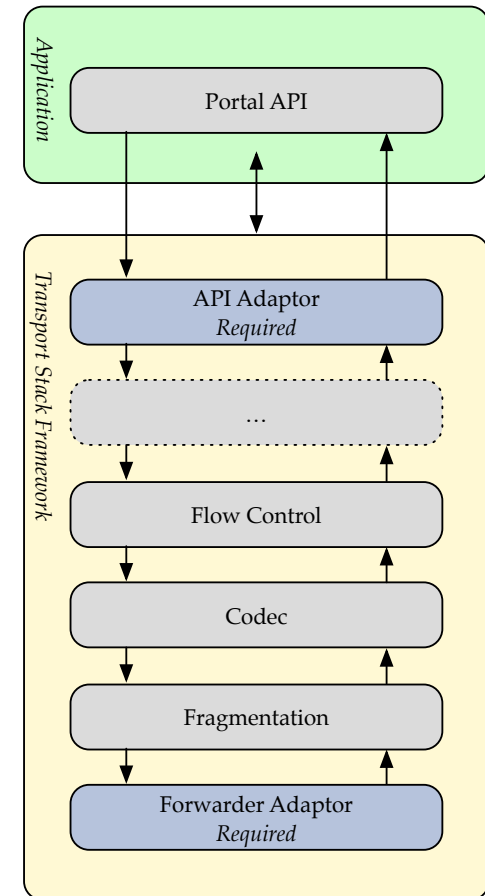
Portal

Portal

Transmit and receive Interests/Content Objects

Control stack construction behavior

API to the basic protocols



Information Data Framework

- A CRUD interface to data in the network.
 - Simple semantics for Create, Read, Write, Delete.
 - Data is provided and consumed without the details of Interests and Content Objects.
 - Security concerns are handled for the application.
 - Implementations may support varying ACID semantics.

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