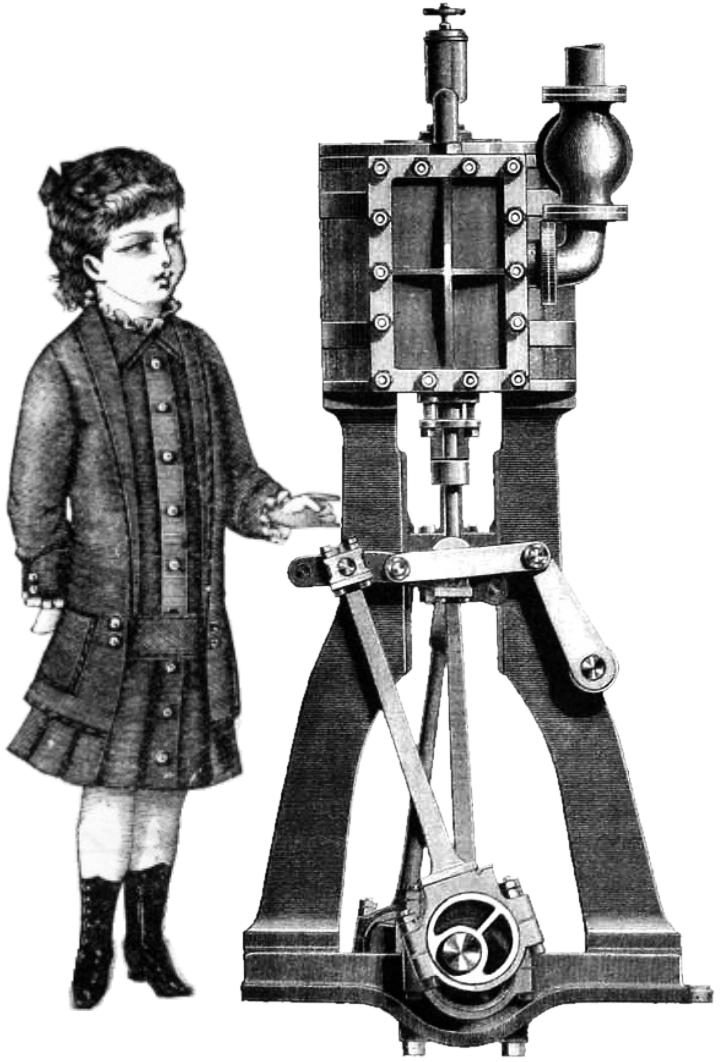
Powerful Toys



A Toolkit Approach to Windows Interoperability

Christopher R. Hertel
Samba Team

Samba/XP
May, 2015

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Introductions

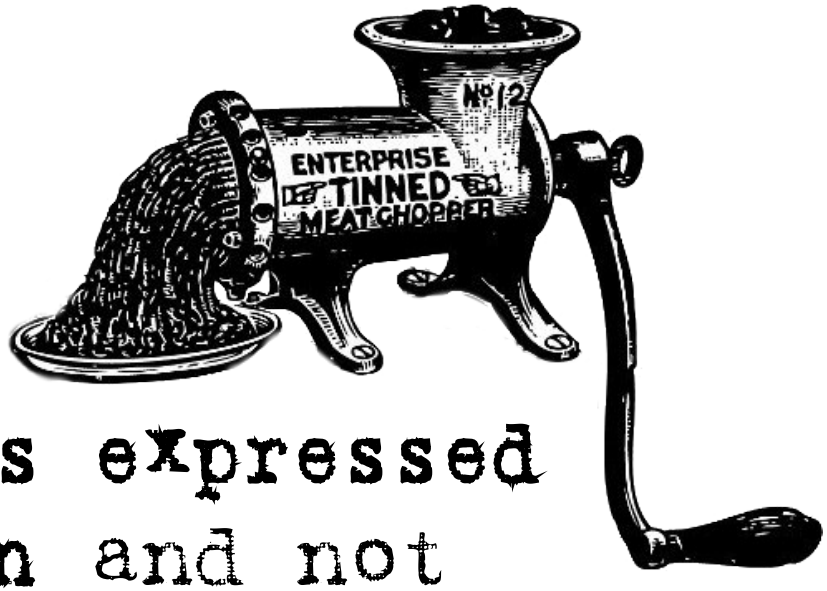
Introductions

Me

- Samba Team Member
- SMB Author
- Former Microsoft Docs Contractor
- Ice Cream Consumer
- Incurable Idealist

Introductions

Me

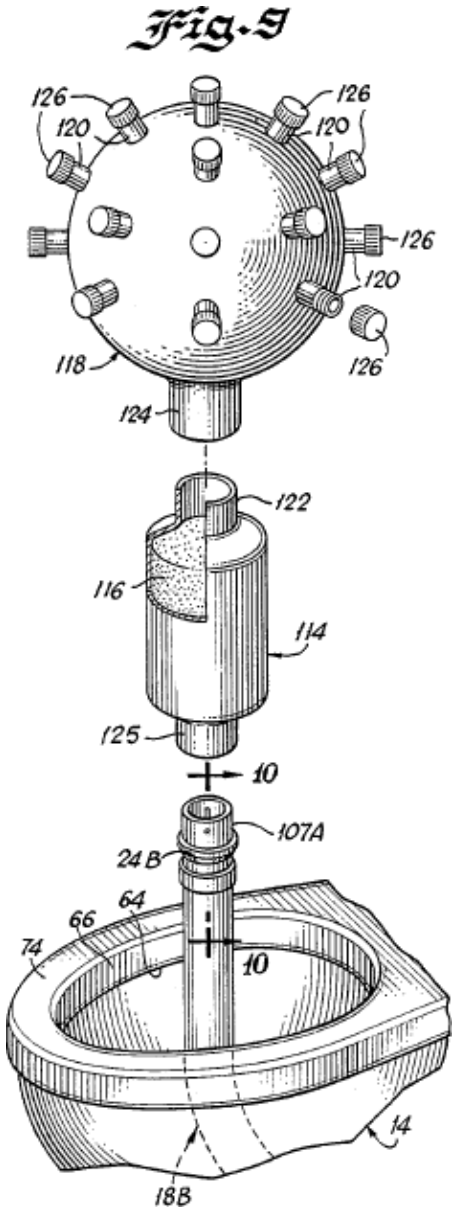


The opinions expressed are my own and not necessarily those of my employer, my spouse, my spirit familiar, the Internet, or the monster in the closet.

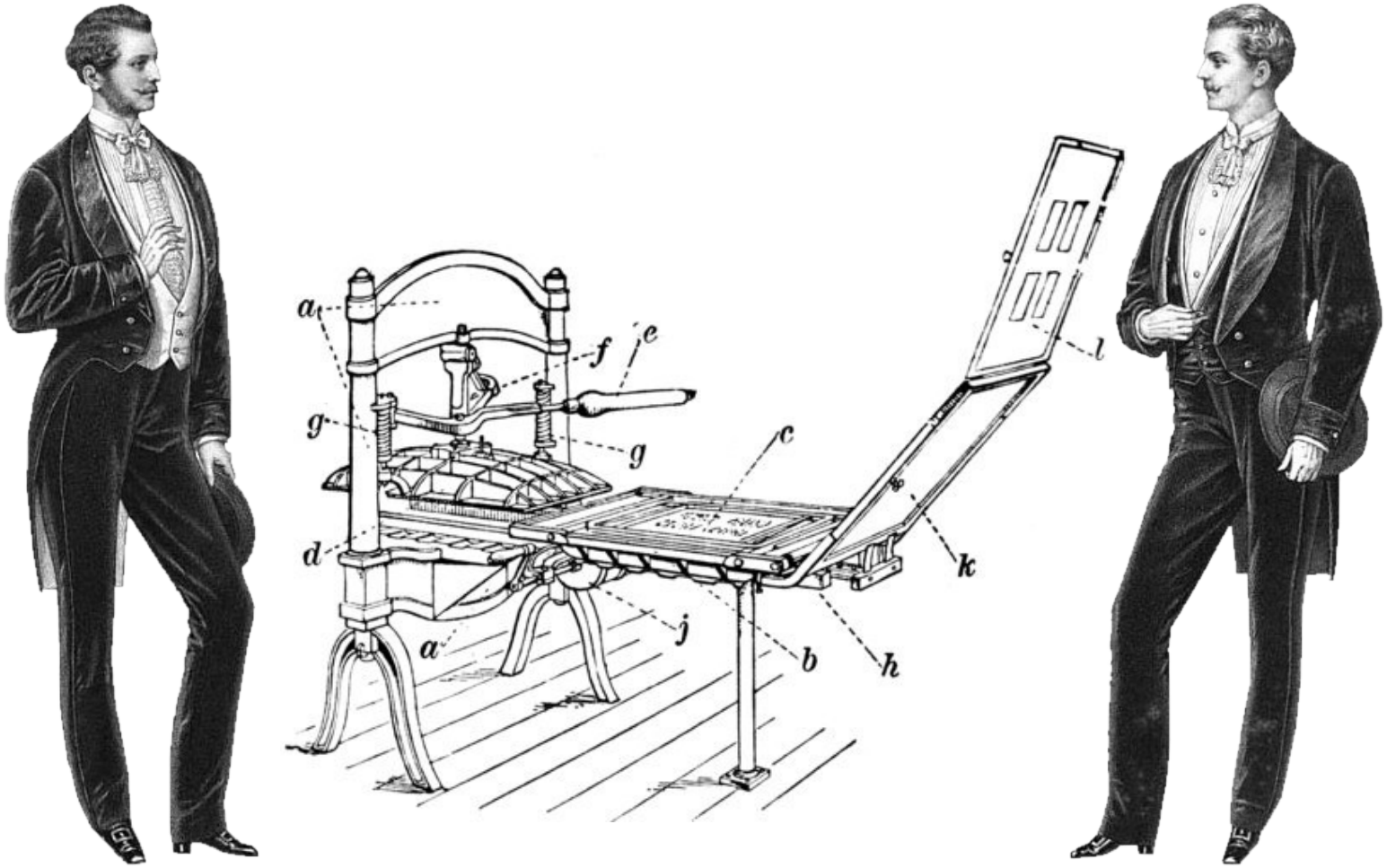
Introductions

A Brief Overview of the Topics I Plan to Cover with You on this Very Fine Day

- The Challenge Before Us
- Toolkits
- Works in Progress
- Carnaval
- The Summing Up (Q & A)



The Challenge



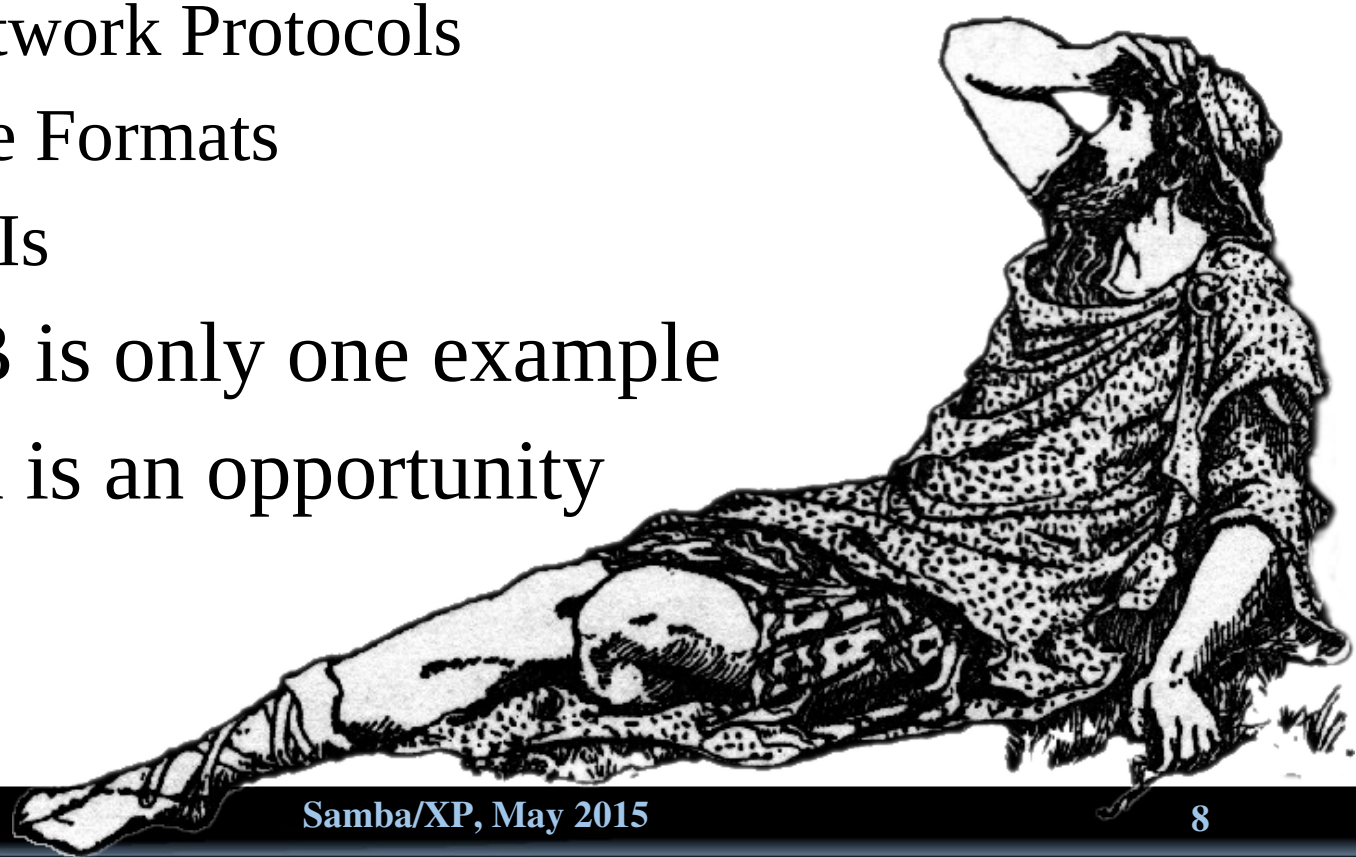
The Challenge

Windows Interoperability

The Challenge

Windows Interoperability

- Windows is Big. Really, Really Big.
- There are hundreds of documents
  - Network Protocols
  - File Formats
  - APIs
- SMB is only one example
- Each is an opportunity

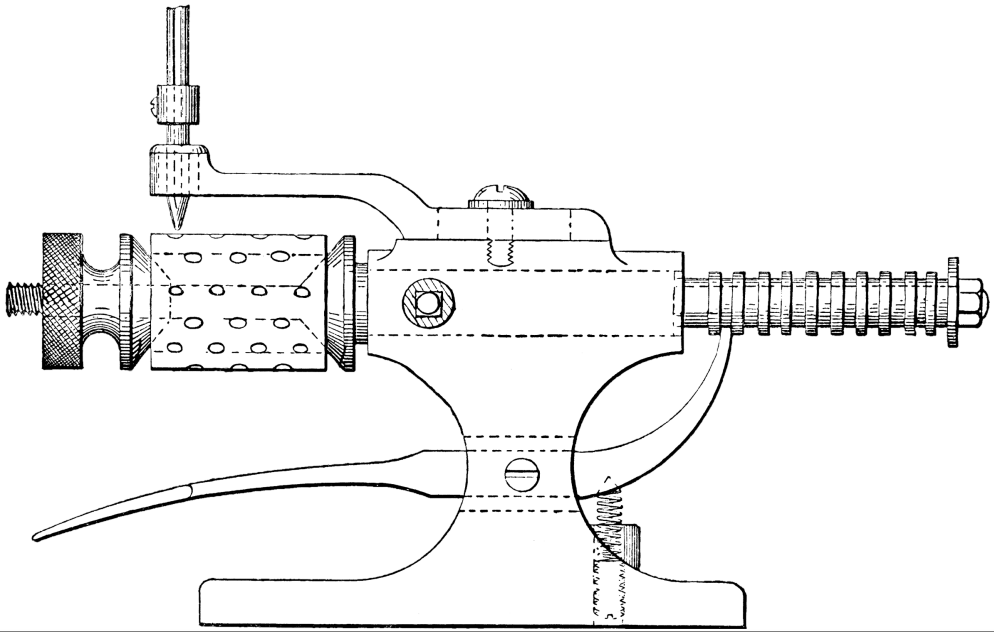


The Challenge

—"We should implement all of them."—

...or maybe just:

- Pick your battles
- Implement key components
- Build the complex from the simple

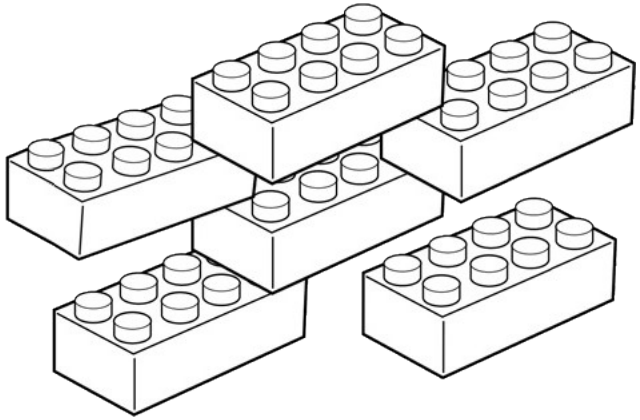


Toolkits

Toolkits

So, Let's Build Toolkits

- Modules and Libraries
- Small Enough to be Replaced
- Clearly Defined APIs
- Well Documented



You can build what you need from parts.

Toolkits

This is an Old Model

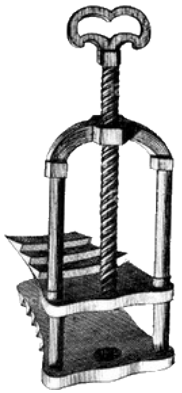
- Basic Software Design
- Seeing a Resurgence in Web Services
- Requires Up-Front Analysis
- Does Not Lead Directly to a Product

Toolkits

Case in Point: jCIFS

SMB1 Toolkit in Java

- Modular, Open, Object Oriented
- Foundation for Davenport
  - *NTLM over HTTP Toolkit*
- Used in Embedded Systems
- Used in Apps



Toolkits

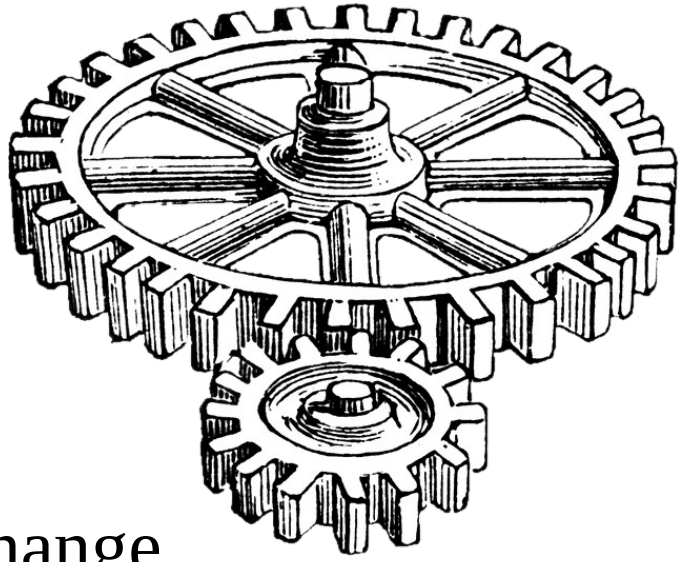
Case in Point: jCIFS

Time Marches On

- No SMB2/3 Support
- Outdated Authentication
- Small Community
- In Need of an Enthusiasm Infusion

Toolkits

Samba is Also a Toolkit



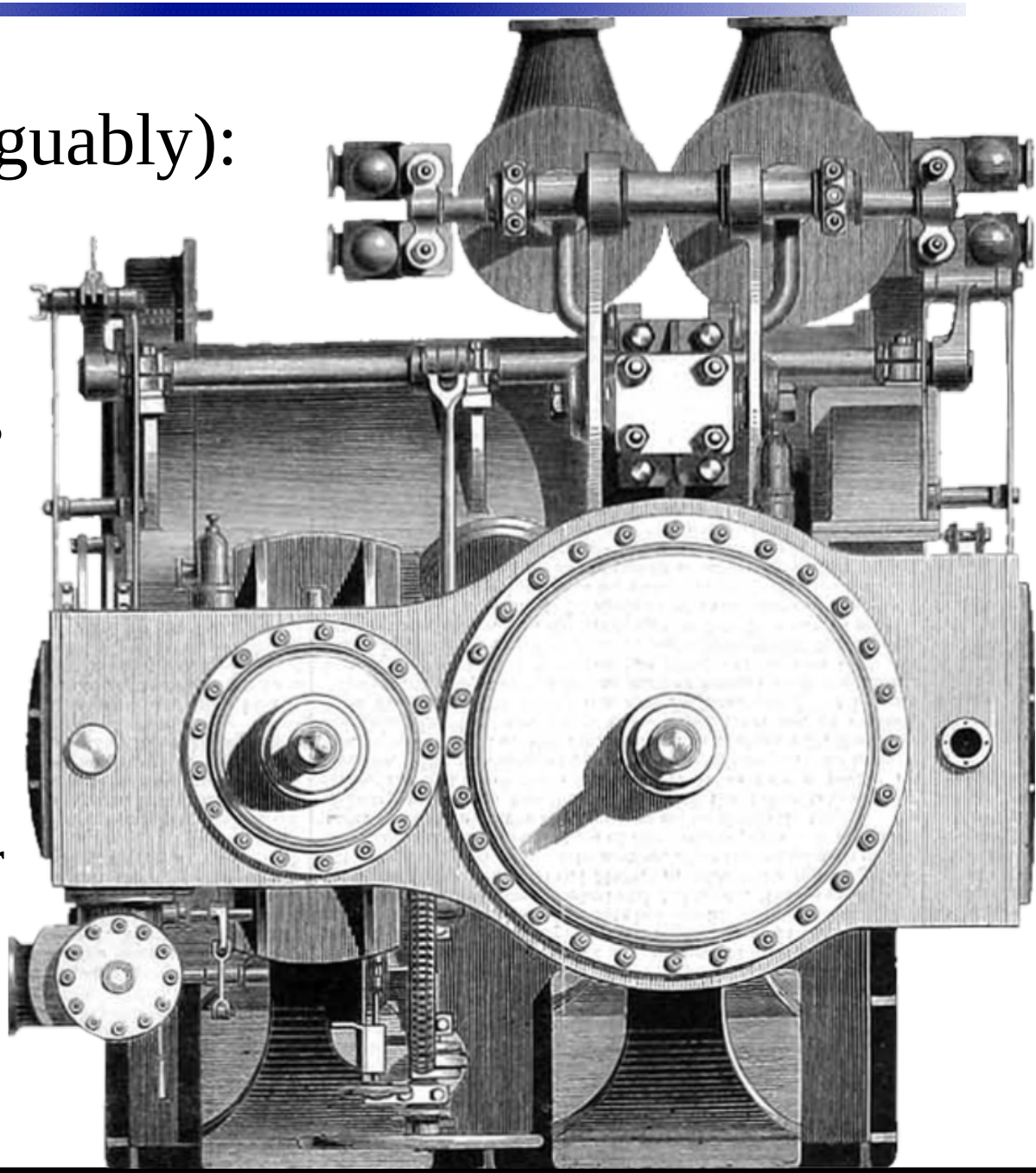
- Long-standing project
- Strong community
- Robust codebase
- Subject-Matter Experts
- Foundation for OpenChange
- SoHo NAS to Cluster Servers
- A Favorite with Storage Start-Ups

Samba is used in a wide variety of products, and has been popular for a long time.

Toolkits

Samba (arguably):

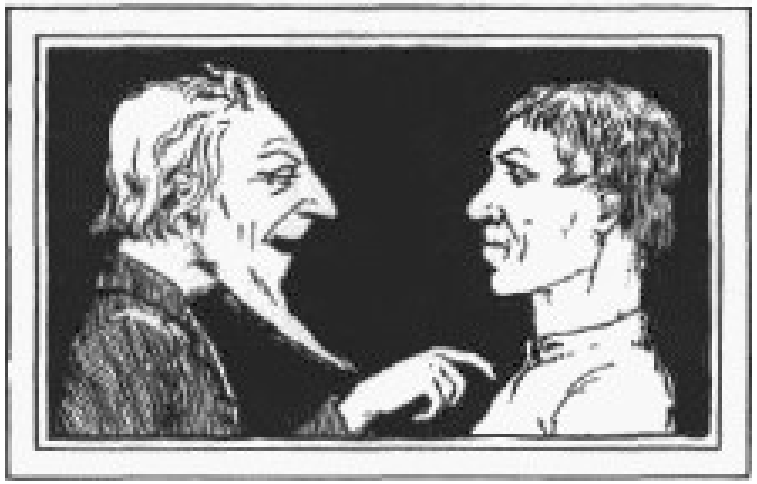
- Surfeit of Integrated Subsystems
- Large Codebase
- More Cathedral than Bazaar
- Daunting, Monolithic



Toolkits

Samba (arguably): Not Really a Toolkit

This, in fact, is the argument that lead to the creation of jCIFS.
(It was a very polite argument.)

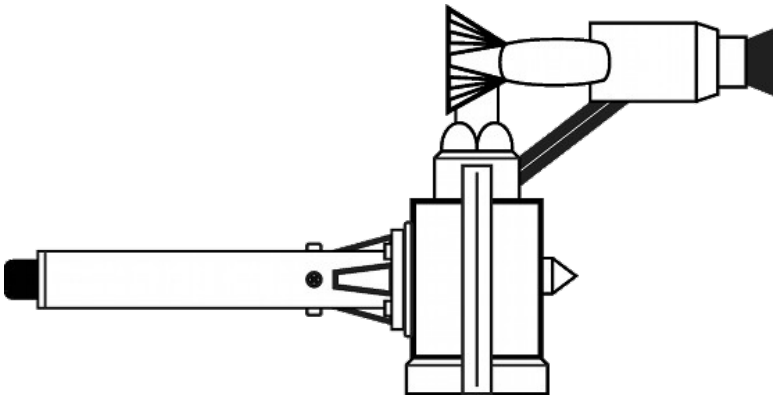


Works in Progress

Work in Progress

Solid Projects and False Starts

- jCIFS
- libCIFS
- STiB
- Prequel
- Carnaval



These are examples. Most of them need more attention and a grander sense of purpose. All of them can also be used as example code to inform other projects.

Work in Progress

jCIFS

The point is: jCIFS has a purpose.
The point is: jCIFS has found a niche.

Work in Progress

LibCIFS: SMB1 Library in C

The Bad:

- Under-developed
- Over-designed

The Good:

- Complete NBT Toolkit
- Well Documented
- Some SMB1 Components
- Could be Revisited
- Lessons Learned

Work in Progress

MS-BITS Upload/Download Utility

The BITS Upload/Download protocol is...

- Small and fairly simple
- An extension to HTTP
- Useful in transferring data to/from Windows servers
- Used by Windows Update

...and it supports MS BranchCache

- Useful for testing distributed caching

Work in Progress

Prequel: Distributed Caching

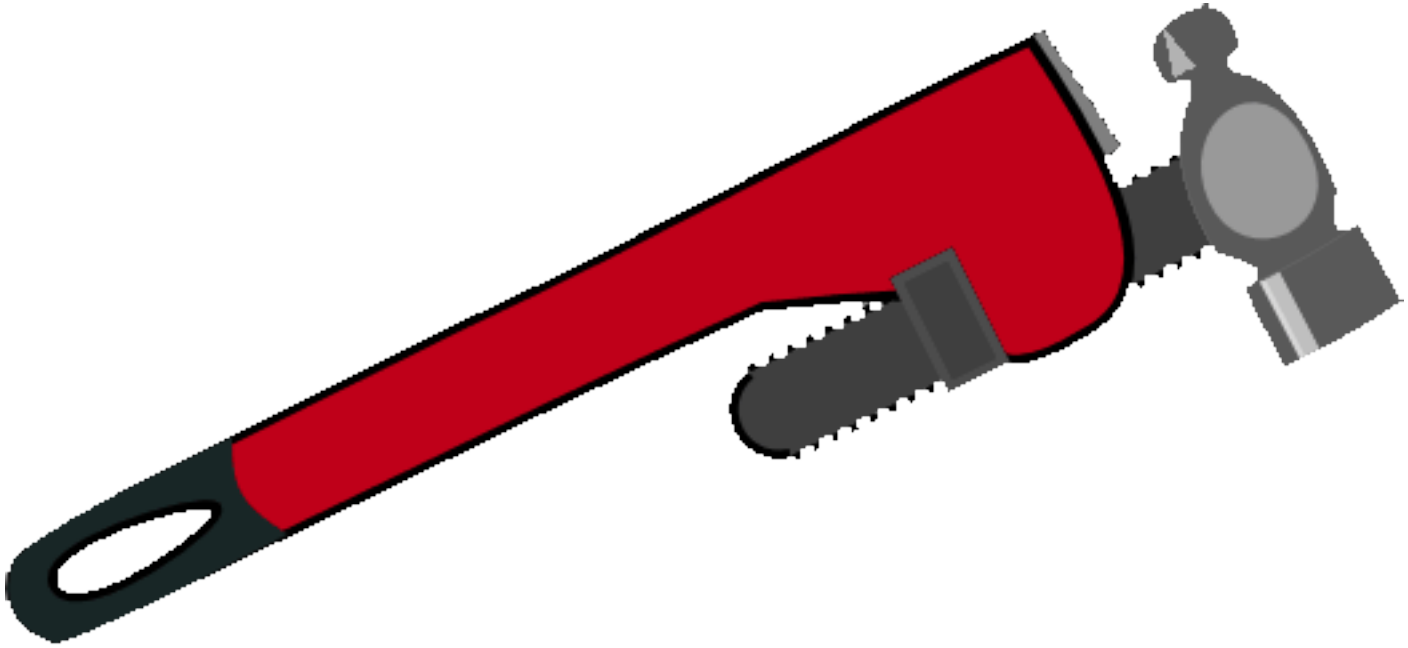
A Project in Distress

- We got just so far, and then got distracted
  - Working Peerdist V.1 Server code
    - ...but it's piecemeal and needs coalescing and clean-up
  - Design and some code for a Hosted Cache
- Needs interest, support, and collaboration

Carnaval

Carnaval

An SMB2/3 Toolkit in Python



Carnaval

An SMB2/3 Toolkit in Python

- Toolkit: Prototyping and testing
- Python: Fast development
- Well documented, to guide the noobz

Carnaval

jCIFS

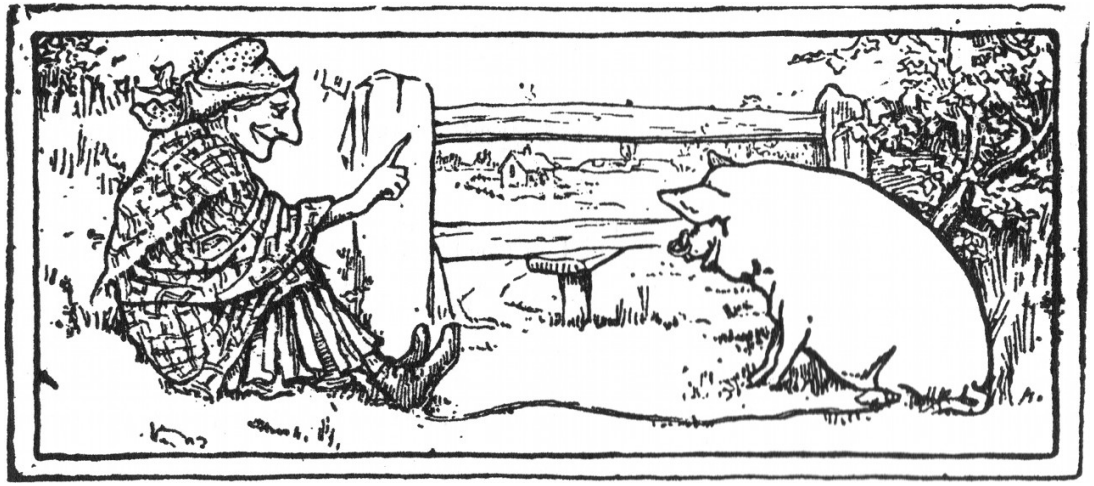
...was a whim.

Carnaval is a bit of a whim, too.

There Are Others

We searched for SMB2+ in Python:

- We found nothing that was complete
- APIs were not clearly documented
- SMB know-how was not evident



What's Taking So Long?

- Time Constraints
  - Other Priorities
- Detailed API Documentation
  - Pydoc
- Testing
  - Doctest
- Careful Coding

Carnaval

Goals

- SMB2 Support
  - Skip SMB1
    - The jCIFS client already supports SMB1
    - W2K3 is the only non-SMB2 Windows still under support[1]
    - Once SMB2 is complete, we can (if we want) back-fill SMB1
    - So, okay, SMB1 NegProt & Echo

[1]For another two months.

Carnaval

Goals

- Share Know-How
  - Few learn SMB because they want to
  - Most learn SMB because they have to
- Make it easy to create a simple server
  - Embedded, perhaps, in an application
- Client access to SMB services
  - For simple apps,
    such as file browsers

What's Done

- NBT Layer
  - Quick and easy to implement
  - Very well known protocol
  - A chance to practice on something easy
- SMB1 NegProt & Echo
  - SMB2 can be negotiated from SMB1
  - SMB2 servers respond either with an SMB2 NegProt, or by closing the connection

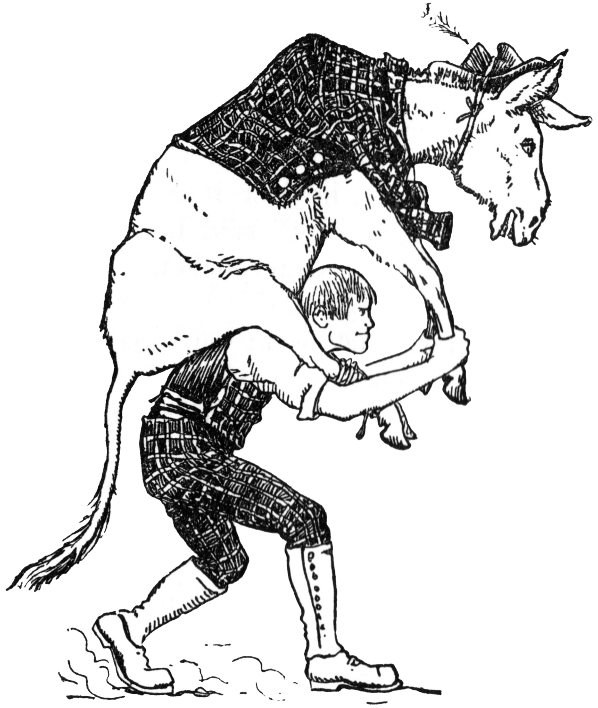
What's Done

- The First Few SMB2+ Commands
  ...are in testing

- GitHub:
  https://github.com/ubiqx-org/Carnaval

What's Done

Basically, we've gotten the easy stuff out of the way.



Now we're doing the heavy lifting.

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Summaries

Questions?
The Tacky Tie Show

The End