



**Macintosh[®]
Communications
Toolbox**

Road Map

Positioning

Overview

The User Experience

Concepts/Details

Runtime Environment

Summary

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Summary

Macintosh[®] Communications Toolbox

Communications services for Macintosh...



Data Connections



Terminal Emulations



File Transfer Services

...integrated into basic System Software.

Objectives

- Increase value of the Macintosh® computer by adding pervasive communications in key environments
- Leverage third party developers

Significance–1

- Easier to create great communications applications
 - Standard API's
 - Open Architecture

Significance-2

Extends the power and consistency of the Macintosh[®] computer to communications

Connection Configuration OK
Method: **Modem** Cancel

Modem Settings

Answer phone after ring(s)

Dial Phone Number:

Redial times
every seconds

Dial:

Port Settings

Baud Rate:

Parity:

Data Bits:

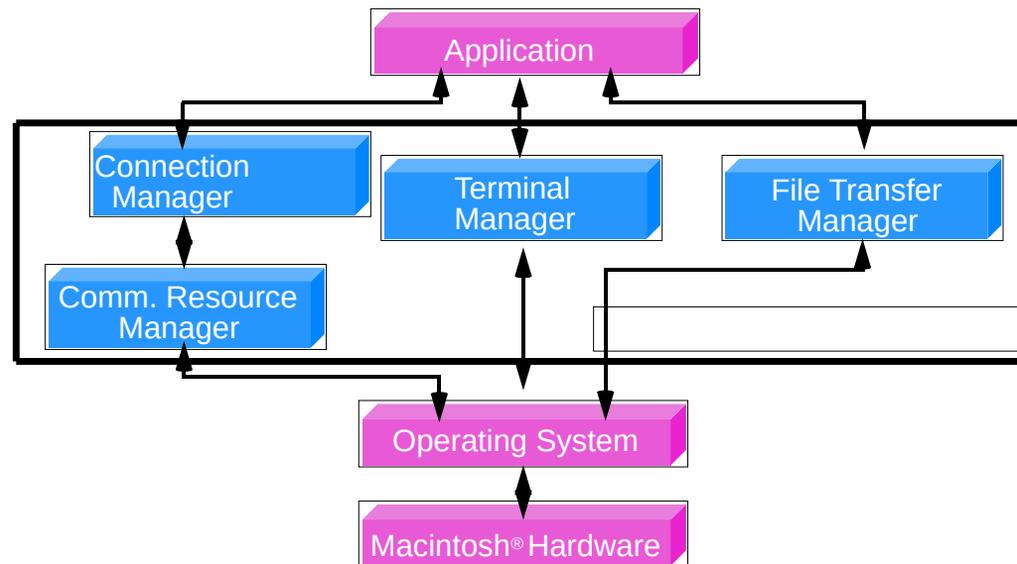
Stop Bits:

Handshake:

Current Port

 Modem Port  Printer Port

High Level Flowchart



Main Components–1

Connection Manager and Tools

- Serial Connection Tool
- Modem Connection Tool
- LAT Connection Tool
- MacPAD (X.25) Connection Tool

Main Components–2

Terminal Manager and Tools

- TTY Terminal Tool
- DEC VT102 Terminal Tool
- DEC VT320 Terminal Tool

Main Components–3

File Transfer Manager and Tools

- ASCII Text File Transfer Tool
- XMODEM File Transfer Tool

Main Components–4

Communications Resource Manager

- Identifies installed communication cards
- Support for multiple session environments

Unique Advantages

- Consistent user interfaces across applications
- “Small” memory/disk footprint
- Open architecture

Development Status

- Communications Toolbox available through APDA
- Managers are final
- Tools are beta

Apple Products Using the Toolbox

- MacX
- MacX25
- MacWorkStation

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Overview

The User Experience

Concepts/Details

Runtime Environment

Summary

Design Goals

Standard Access to Communications Services

- Development of Better Communications Software
- Leading to Improvement in overall User Experience

Communications Services



Data Connections



Terminal Emulations



File Transfer Services

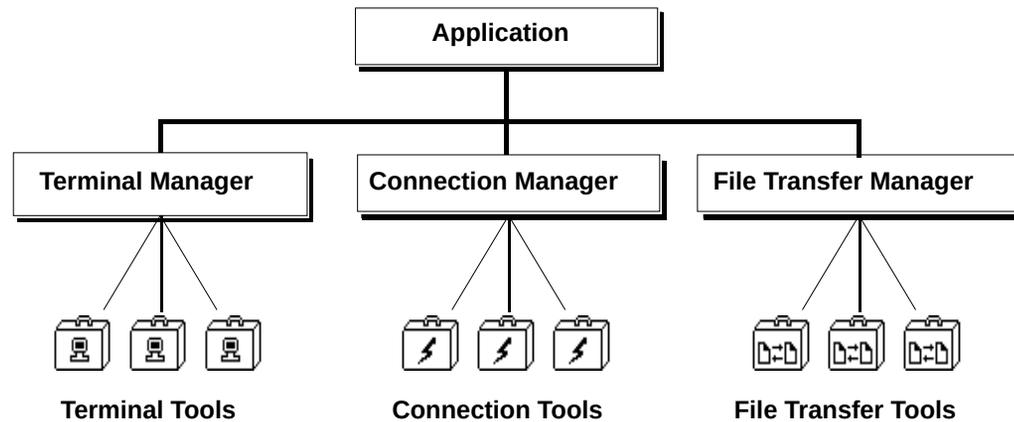


High Level Architecture

Application

Managers

Tools



System Requirements

- Bundled with System 7.0
- Compatible with System 6.0.4 and later
- Applications/Tools may have different system requirements

Development Platforms

- MPW 3.x Development Platform
- Third party platforms that can convert MPW interface files and object files can easily be used for development work

The User Experience

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Overview

The User Experience

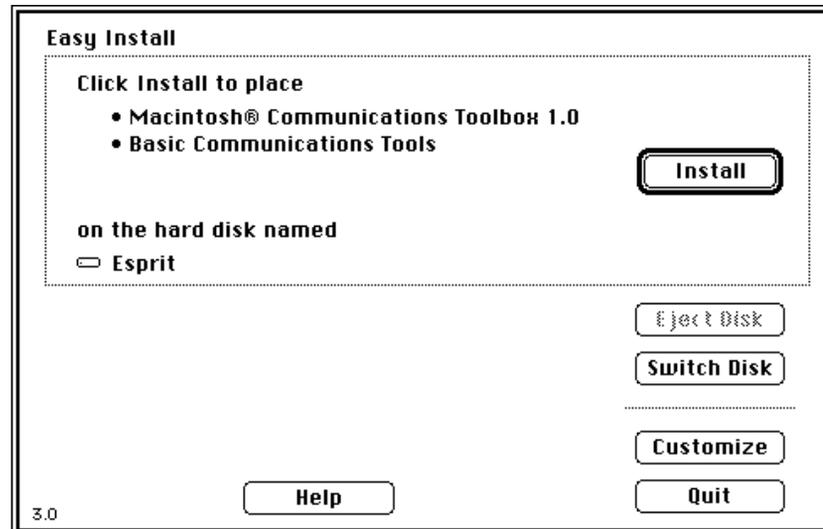
Concepts/Details

Runtime Environment

Summary

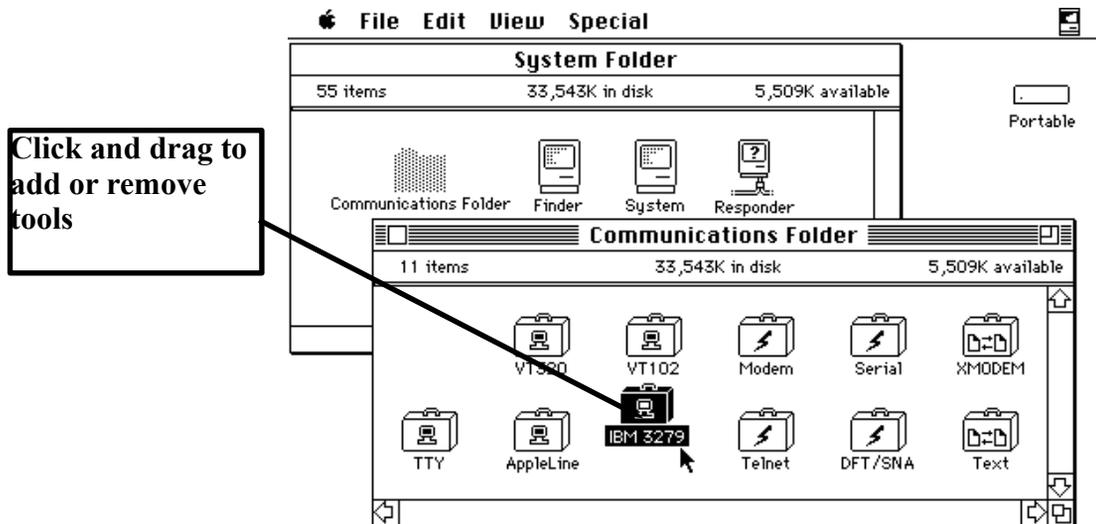
Installation

Installing the Communications Toolbox



Adding and Removing Tools

Manipulating Communications Tools



Applications and Tools

Using Applications

- Same application independent of communications service

Using Communications Tools

- Same user interface independent of applications

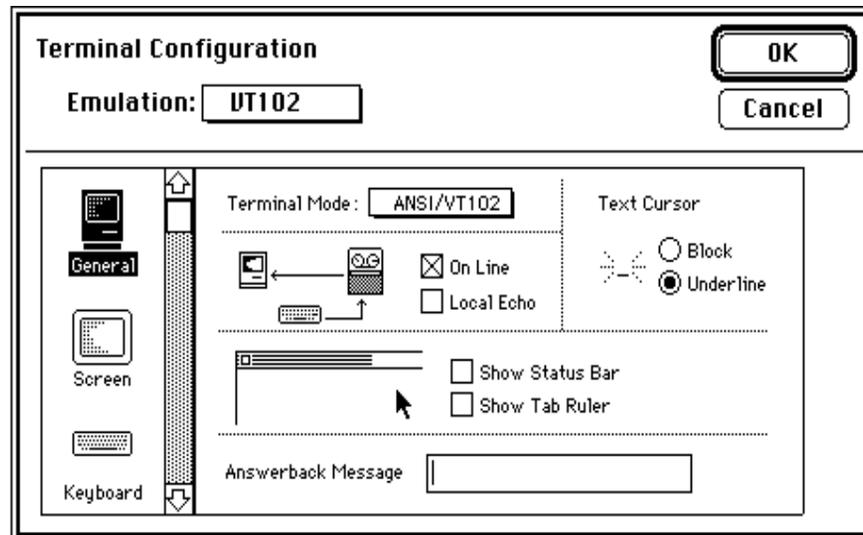
Using Tools

Choosing the Right Tool

- Application has “default” settings
- Or use settings from documents

Configuring Tools

Configuring is same across all applications



Concepts and Details

Positioning

Overview

The User Experience

Concepts/Details

Runtime Environment

Summary

Manager and Tools

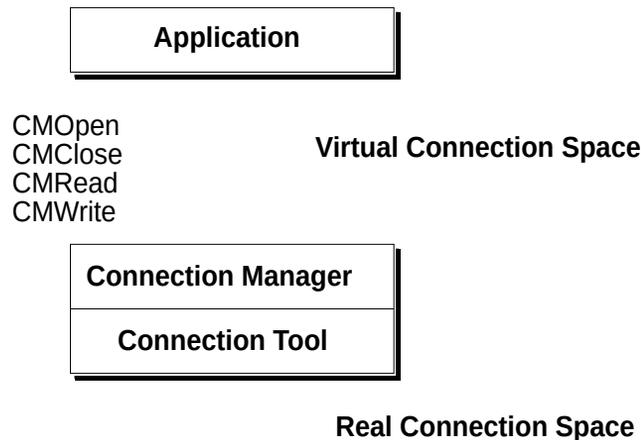
What the Managers Do

- Provide applications with access to classes of functionality

What the Tools Do

- Perform all functionality associated with a given communications service

Virtual Connection Space



Device manager calls
Packet assembly/disassembly
Error correction/detection

What is a connection?

- Byte stream, non-transactional
- Point to point (not broadcast)

Core Routines

- Manipulate tool records (allocation, validation, disposal)
- Provide user interface for configuring tool records
- Translate tool configuration string between English and other languages

Terminal Manager Routines

Manager Routines

- Process events (keystrokes, mouse downs, updates)
- Scrolling

Application Callbacks

- Mouse handling routines
- Transmit data to remote

Connection Manager Routines

- Open or close a connection
- Read/write data
- Check connection status
- Listen for connection request
- “Break”

File Transfer Manager Routines

Manager routines

- Send/receive a file
- Stop a file transfer

Application callbacks

- Send/receive data onto connection

Comm. Resource Manager

Two Roles

- Internal routines to support Communications

Toolbox

- Registration for communications devices, *e.g.* serial port devices register input/output driver names

Comm. Toolbox Utilities

Popup Menu CDEF

- Easy inclusion of popup menus that conform to Human Interface Guidelines

Variation Codes

- Use mctb resources
- Use AddResMenu
- Use window font/size

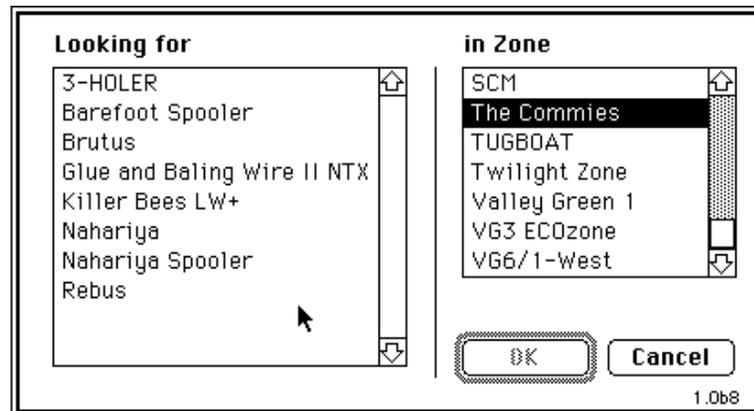
Baud Rate:	<input checked="" type="checkbox"/> 300
	1200
	2400
	9600
	19200
	57600

Comm. Toolbox Utilities

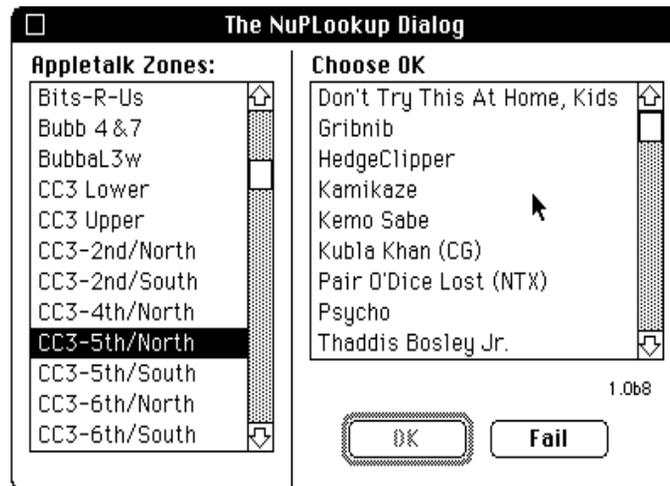
Network Lookup Package

- Single Call to perform standard NBP

Lookups



Comm. Toolbox Utilities



• Fully customizable and configurable

- Custom dialogs
- Event filtering
- Item hit filtering
- Dim/remove items from zone/item lists
- Override NBP lookup parameters

Comm. Toolbox Utilities

Dialog Manager Extensions

- Appending one item list to another
- Shortening dialog item lists

Runtime Environment

Positioning

Overview

The User Experience

Concepts/Details

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Summary

Startup Time

Installation

- INIT 29 in System file

Access from INIT's

Memory Models

Small memory model (1 MB RAM)

- Managers installed at InitXXX time

Large memory model (> 1 MB RAM)

- Managers installed at startup time

Code Sharing

Manager code is shared across all applications

Tools are shared within an application, but not across applications

- Tools should be designed to be reentrant and multiply instantiatable

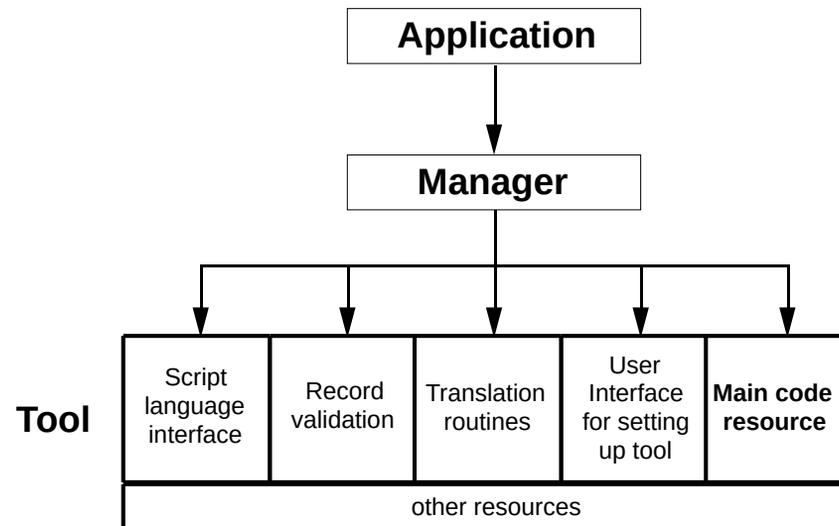
Components of a Tool

Multiple Code Resources

- Discrete Entry points
- Message selectors

Message Passing Architecture

Application calls routed to appropriate code resource



Tool Files

- Code resources
- Other resources
 - ‘vers’ resources
- File types
 - 'fbnd', 'cbnd', 'tbnd'

Large Tools

- > 32K can be accommodated via MPW Linker
(but still offsets limited to 32K)
- Perform your own segmentation
- Development environments may provide alternative means

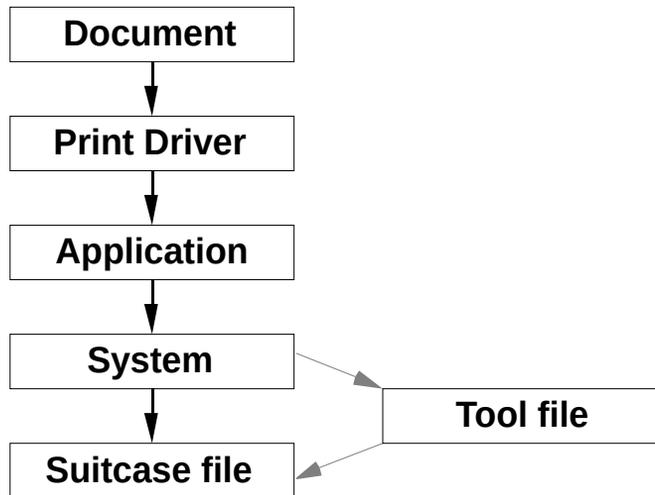
Tools and Resources

Resource ID's

- Heuristically avoid conflicts by choosing “high” resource ID's (> 10000)
- Potential for conflicts among tools and between tools and the applications or System file still exists

Resource Conflict Resoluion

Algorithm for Resolution



Tools are dynamically patched into and out of resource chain when jumping into/out of tool code resources

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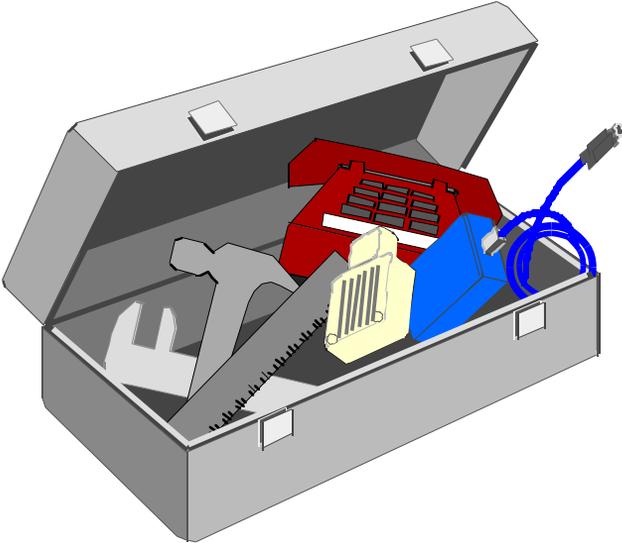
Key Benefits

- Applications can be developed independently of services
- Support for services can be developed independently of applications
- Consistent user interface across applications

Future Directions

- Libraries of Objects for use with OOP Languages (C++, Object Pascal)
- Expand the Virtual Connection Space to better support transactional environments
- Incorporation of developer and user feedback

Questions?





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