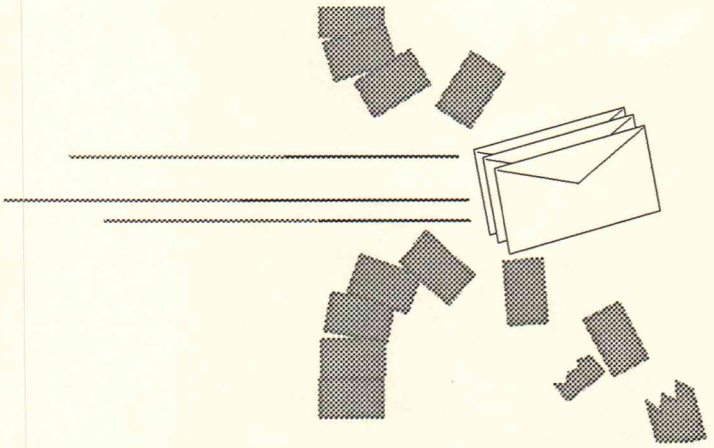


Presentation Paper 84 90

Well organized
Very interesting &
Good info, but
too technical
level presentation.
of Management
WUGate & WWIV not
good explanation. Appendix (p56) was
would have helped. Actual examples

WUGATE

A Network Gateway

Andrew W. Gaunt

October 2, 1993

TABLE OF CONTENTS

MANAGEMENT SUMMARY

This system is designed to join two computer networks and allow the passage of messages between them. The design goes into more detail than necessary at times, as it is being written after the actual implementation. It is difficult to neglect the reality of the system when trying to document ex post facto. If the document were written prior to implementation, it would be easier to stay within a more hypothetical vein.

The system is currently working well and plans to further improve it are currently underway.

FUNCTIONAL REQUIREMENT

WUGATE is to provide a means to gateway messages between two discontinuous types of computer networks, WWIVnet and UUCP. It must be bi-directional and robust. Thought must be given to how easy it is for users on both sides of the gateway to use it. The easier, the better; however, not at the expense of functionality.

WUGATE runs on an IBM PC compatible hardware platform. The design should consider constraints imposed by older (slower) hardware that WUGATE may be installed on. For older hardware, the main constraint is processor speed. A slow processor can make the system ostensibly unusable if performance is poor.

SYSTEM DESCRIPTION

One of activity humans engage in is communication. They disseminate information, debate issues, and share knowledge to name a few things. Until recently, most of this communication has taken place via public oratory, private conversation, mail, newspapers, and radio/television. Today, we are witness to the infancy of new communications media, made possible with networked computers.

Electronically distributed mail offers its user a means of private communication with other people (and in some cases non-human recipients). Electronically distributed "news" or "bulletins" offer these same users a means to broadcast a message to a host of willing recipients.

One of the problems with today's email[1] networks is a lack of uniform standards. The result is discontinuity between email networks of differing standards. This project addresses this problem by defining a gateway system between two discontinuous computer networks. The system is bi-directional, allowing messages to pass from one network to the other in either direction. The two types of networks this system connects are: WWIVnet and UUCP. Both are "store and forward" type networks. Messages originated on one computer are not necessarily sent directly to the final destination. They may be routed though one or more other computers before reaching it. This storing and

---

[1] Email is a common slang term used to refer to some type of electronic mail

forwarding allows messages to be queued and sent over phones lines in batches. Calls can even be deferred until night time when phone usage rates are lower. It is a method devised to lower and share the aggregate transport costs.

The system used to gateway messages (heretofore referred to as WUGATE) is a set of interacting processes that primarily accomplish the gateway function. To more completely define the WUGATE system and how it interacts with WWIVnet and UUCP, Some of the processes defined as WUGATE processes overlap into what are also be considered to be WWIVnet or UUCP processes. Figure A illustrates this relationship.

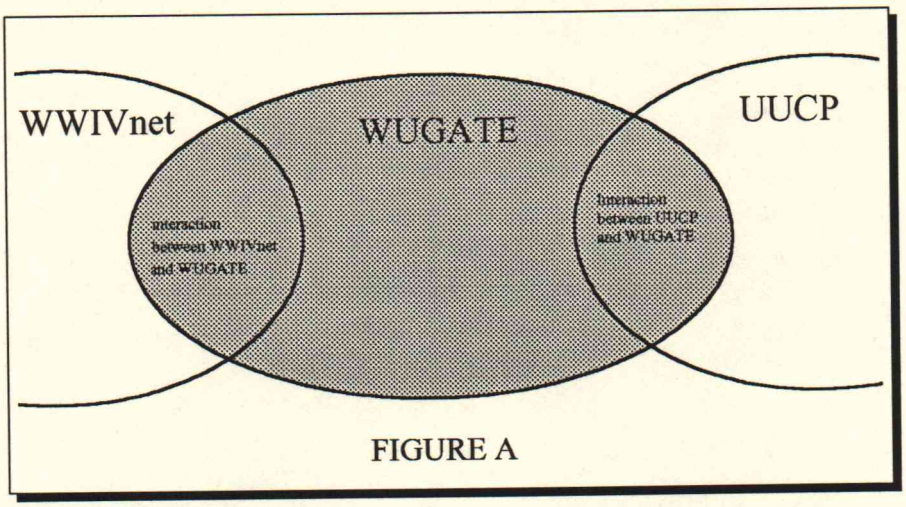


FIGURE A

The UUCP system employed by WUGATE is part of the Waffle BBS, particularly the UUCP sub-system of Waffle. Waffle BBS is a popular BBS system that employs UUCP as its inter-BBS message transport vehicle. Refer to the Glossary for definitions of terms.

IMPLEMENTATION PLAN

The WUGATE system has been in operation since early 1992. It has been enhanced continuously since its first manifestation and will be further improved in the future. This document is written ex post facto.

WUGATE is in use on three computers in New England. The latest version (documented here) is in operation on only one of these three machines. An earlier version (without Usenet News support) is in operation on the two other computers. WUGATE's position in the Systems Development Life Cycle is Implementation and Evaluation with an occasional regression to Development when bugs are found. There are plans to install this newer version of WUGATE on the other two computers when evaluation is complete.

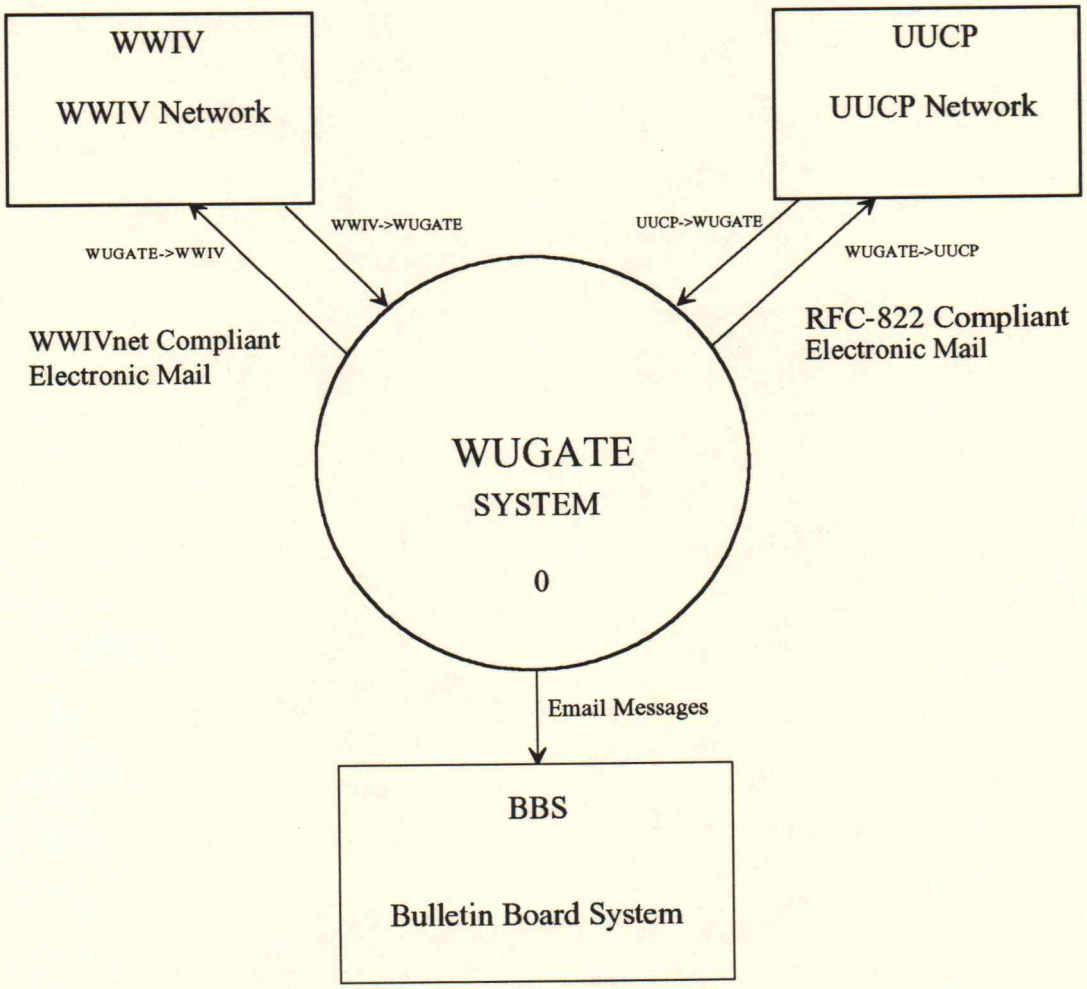
Installation on an operable WWIV BBS node is an moderately complex task, requiring a few modifications to the BBS source code and installation of the WUGATE programs which are distributed through WWIVnet or floppy diskette. When all goes as planned, installation requires about four hours of one experienced person's time. Usually, the administrator of the machine it is being installed on is also present.

Once WUGATE is installed successfully, it needs no further attention unless:

- There is an unexpected problem
- A configuration change is desired

ESTIMATED COSTS/ALTERNATIVE SOLUTIONS

- COSTS WUGATE is to provided by its author to all interested parties free of charge. There are charges for the adjunct --WWIV, WWIVnet, Waffle UUCP-- software. If costs were a consideration --time and labor-- WUGATE would be prohibitively too expensive for its target market. To be available free of charge has been a main objective since its inception.
- Alternative Solutions There are no known alternative solutions.



Context Diagram

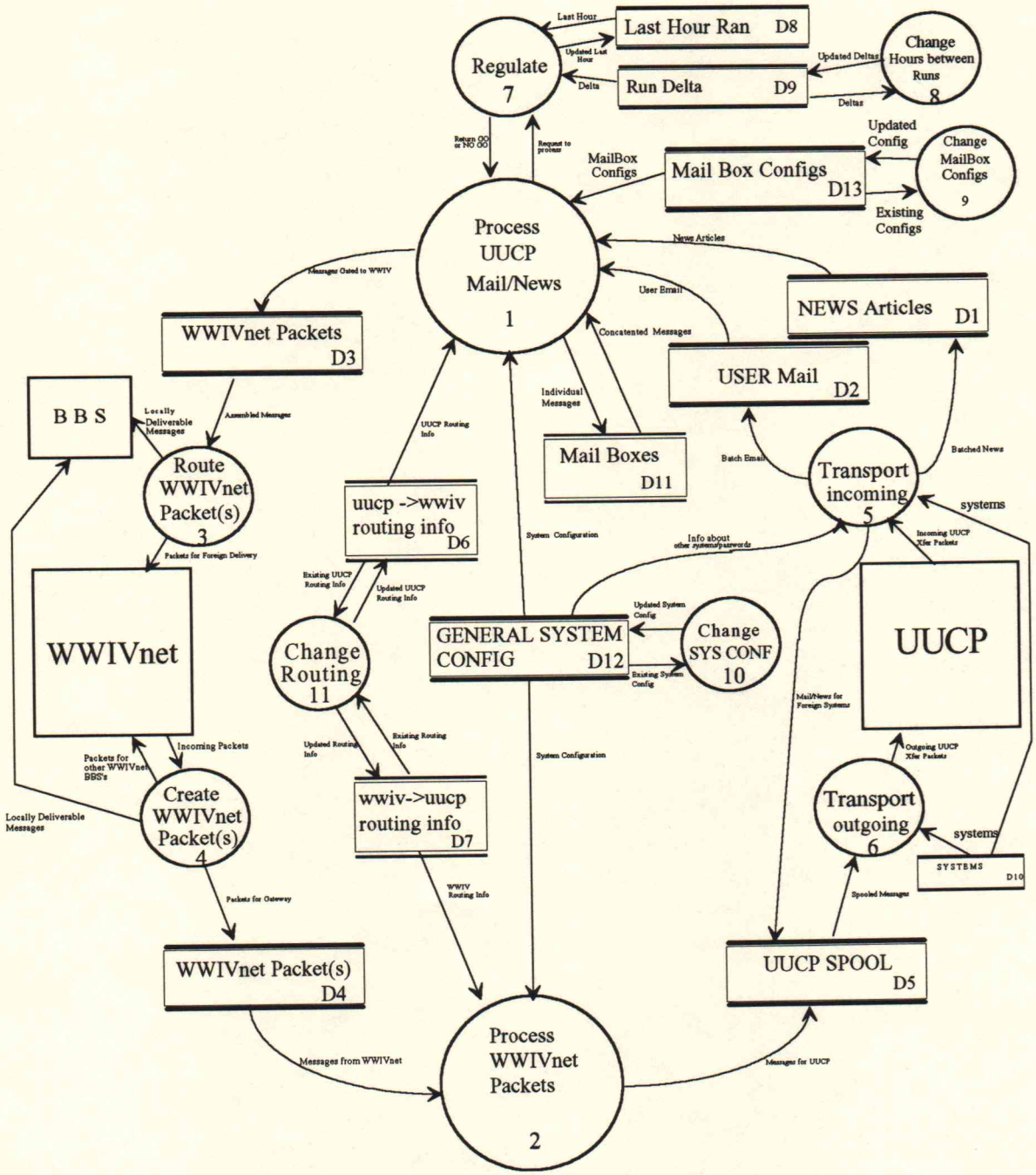

Regulate
7
Last Hour
Updated Last Hour
Delta
Last Hour Ran D8
Run Delta D9
Updated Deltas
Deltas
Change Hours between Runs
8
Return GO or NO GO
Request to process
MailBox Configs
Mail Box Configs D13
Updated Config
Existing Configs
Change MailBox Configs
9
Process UUCP Mail/News
1
News Articles
Messages Outed to WWIV
User Email
NEWS Articles D1
WWIVnet Packets D3
Concatented Messages
USER Mail D2
BBS
Locally Deliverable Messages
Assembled Messages
Individual Messages
Mail Boxes D11
UUCP Routing Info
Batch Email
Transport incoming
5
Batched News
systems
Route WWIVnet Packet(s)
3
uucp ->wwiv routing info D6
System Configuration
Info about other systems/passwords
Incoming UUCP Xfer Packets
Packets for Foreign Delivery
Existing UUCP Routing Info
Updated UUCP Routing Info
WWIVnet
GENERAL SYSTEM CONFIG D12
Updated System Config
Existing System Config
Change SYS CONF
10
UUCP
Change Routing
11
Mail/News for Foreign Systems
Outgoing UUCP Xfer Packets
Incoming Packets
Updated Routing Info
Existing Routing Info
System Configuration
Packets for other WWIVnet BBS's
wwiv->uucp routing info D7
Transport outgoing
6
systems
Create WWIVnet Packet(s)
4
Locally Deliverable Messages
SYSTEMS D10
WWIV Routing Info
Spooled Messages
Packets for Gateway
WWIVnet Packet(s) D4
UUCP SPOOL D5
Process WWIVnet Packets
2
Messages from WWIVnet
Messages for UUCP

Diagram 0

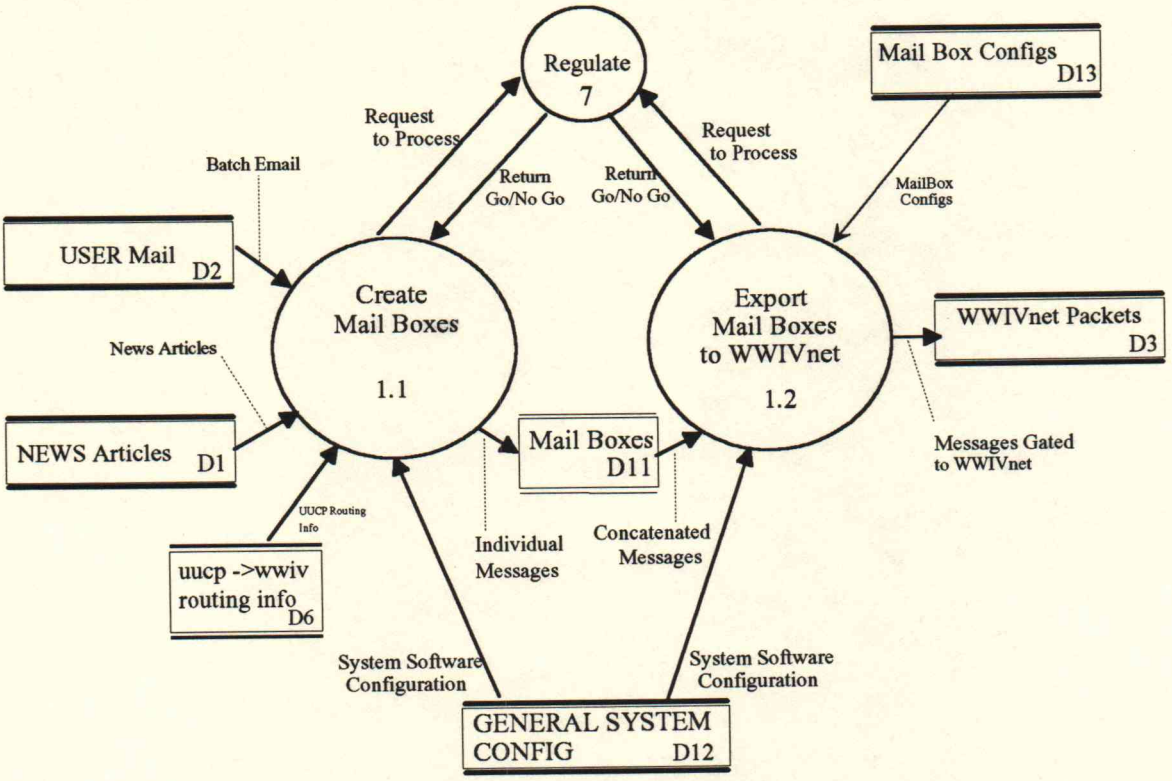

Regulate
7
Mail Box Configs
D13
Request
to Process
Request
to Process
Batch Email
Return
Go/No Go
Return
Go/No Go
MailBox
Configs
USER Mail
D2
Create
Mail Boxes
1.1
Export
Mail Boxes
to WWIVnet
1.2
WWIVnet Packets
D3
News Articles
NEWS Articles
D1
Mail Boxes
D11
Messages Gated
to WWIVnet
UUCP Routing
Info
uucp ->wwiv
routing info
D6
Individual
Messages
Concatenated
Messages
System Software
Configuration
System Software
Configuration
GENERAL SYSTEM
CONFIG
D12

Diagram 1

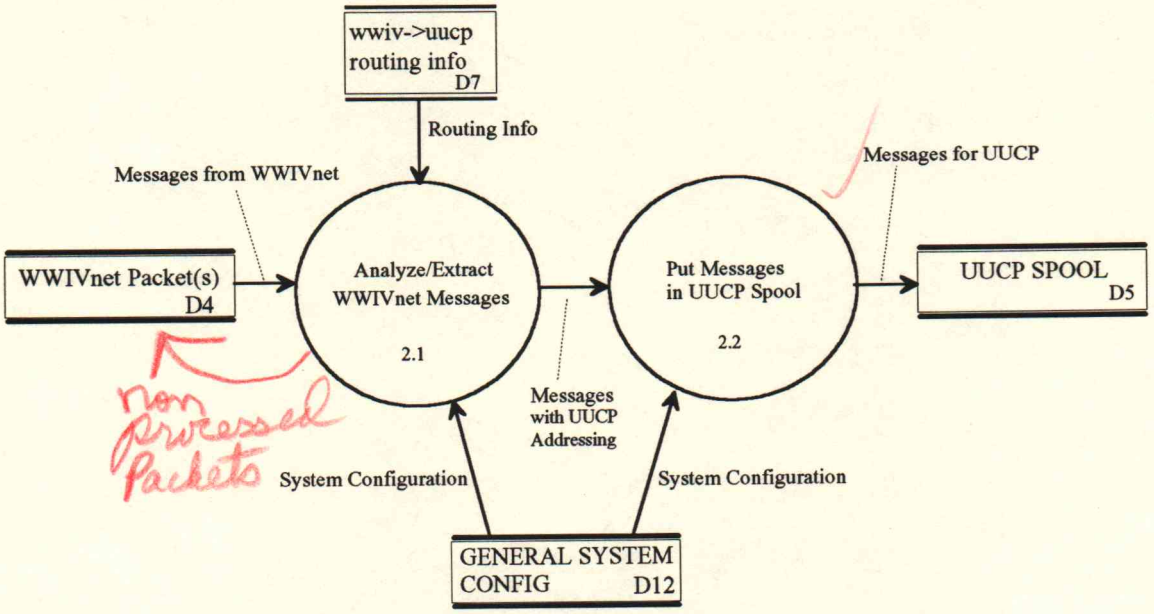

wwiv->uucp
routing info
D7
Routing Info
Messages from WWIVnet
Messages for UUCP
WWIVnet Packet(s)
D4
Analyze/Extract
WWIVnet Messages
2.1
Put Messages
in UUCP Spool
2.2
UUCP SPOOL
D5
non processed
Packets
Messages
with UUCP
Addressing
System Configuration
System Configuration
GENERAL SYSTEM
CONFIG
D12

Diagram 2

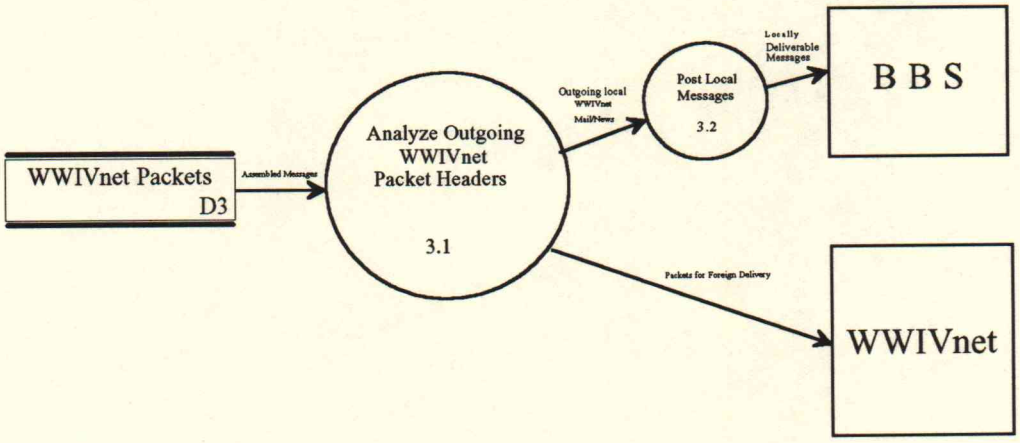

WWIVnet Packets
D3
Assembled Messages
Analyze Outgoing
WWIVnet
Packet Headers
3.1
Outgoing local
WWIVnet
Mail/News
Post Local
Messages
3.2
Locally
Deliverable
Messages
B B S
Packets for Foreign Delivery
WWIVnet

Diagram 3

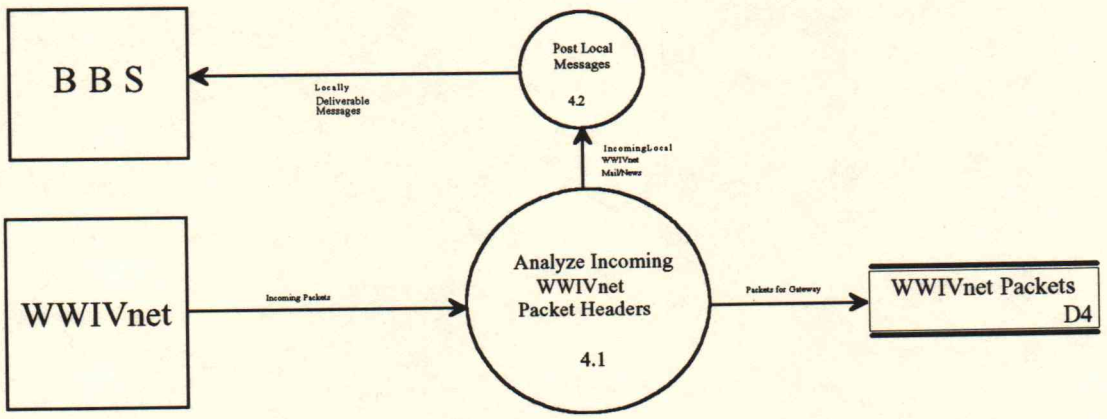

BBS
Post Local Messages
4.2
Locally Deliverable Messages
IncomingLocal WWIVnet MailNews
WWIVnet
Incoming Packets
Analyze Incoming WWIVnet Packet Headers
4.1
Packets for Gateway
WWIVnet Packets
D4

Diagram 4

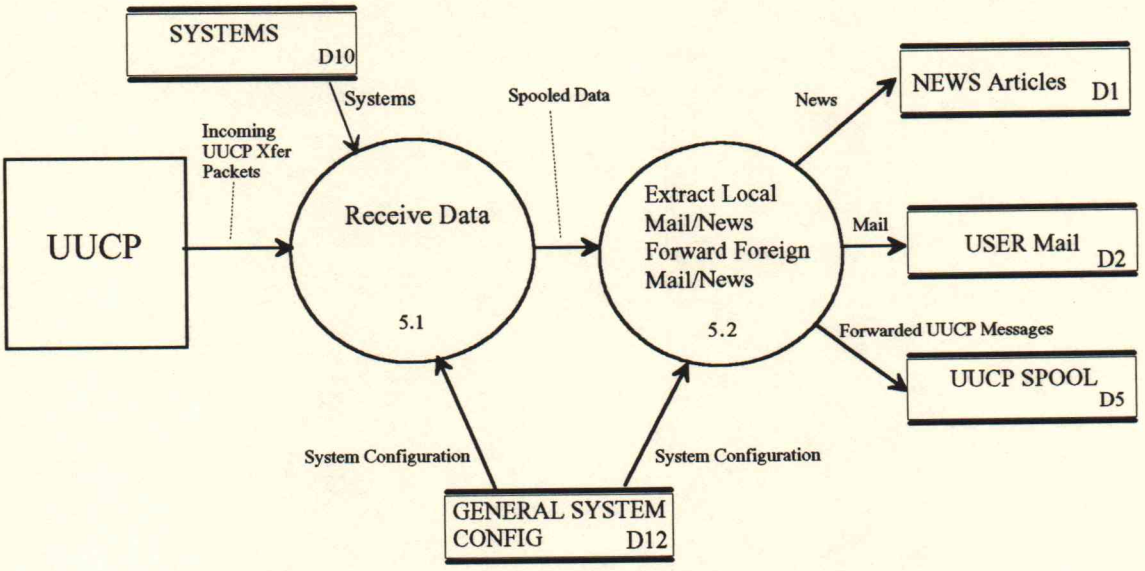

SYSTEMS
D10
Systems
Spooled Data
News
NEWS Articles
D1
Incoming
UUCP Xfer
Packets
UUCP
Receive Data
5.1
Extract Local
Mail/News
Forward Foreign
Mail/News
5.2
Mail
USER Mail
D2
Forwarded UUCP Messages
UUCP SPOOL
D5
System Configuration
System Configuration
GENERAL SYSTEM
CONFIG
D12

Diagram 5

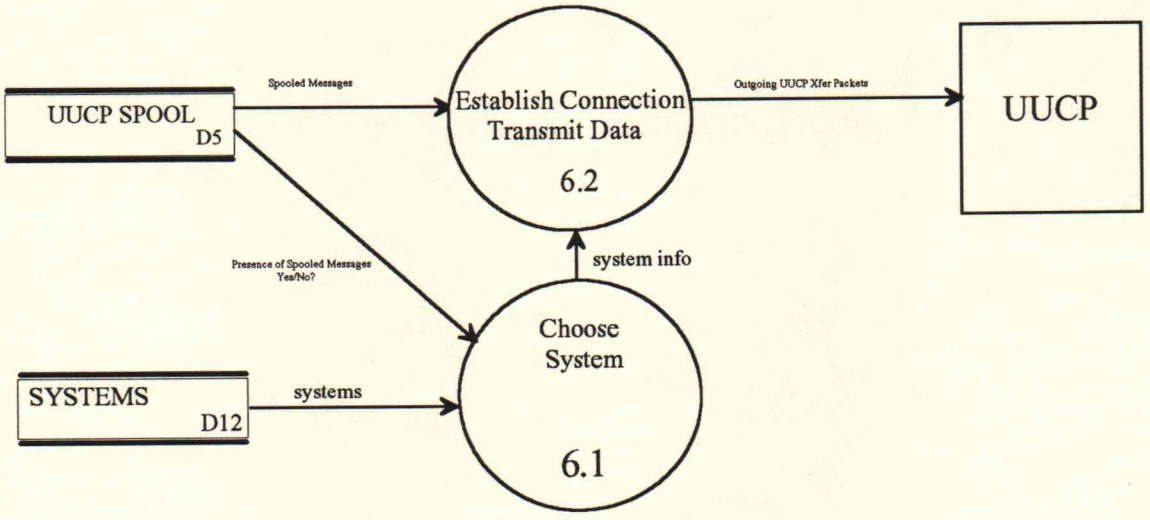

UUCP SPOOL
D5
Spooled Messages
Establish Connection
Transmit Data
6.2
Outgoing UUCP Xfer Packets
UUCP
system info
Presence of Spooled Messages
Yes/No?
Choose
System
6.1
SYSTEMS
D12
systems

Diagram 6

PROCESS NAME: 1.1 - Create Mail Boxes

PURPOSE: Take individual messages from UUCP and store them in Mailbox files for subsequent processing

INPUT DATA FLOWS: News Articles, User Email, System Configuration, UUCP->WWIV Routing Info, Return GO/NO GO, Request to Process, Individual Messages

PROCESS DESCRIPTION: MailBoxes are the common ground for all messages coming in from UUCP. By converting all incoming messages (news and mail) to MailBoxes, a common process (Export MailBoxes) can forward them to WWIVnet. A Mailbox is nothing more than all of individual messages for a particular destination concatenated into a single file. It is similar to a UNIX™ user's mail box.

For each incoming message
    Determine message's destination
    Concatenate message to appropriate MailBox

See: Appendix "PROCUUCP"

PROCESS NAME: 1.2 - Export MailBoxes

PURPOSE: Read existing mailboxes, determine their WWIVnet destination, and create WWIVnet appropriate packet files.

INPUT DATA FLOWS: Concatenated Messages, System Software Configuration, Return GO/ NO GO, MailBox Configs

INPUT DATA FLOWS:

OUTPUT DATA FLOWS: Request to Process, Messages Gated to WWIVnet

PROCESS DESCRIPTION: This process must read in the mail boxes and be able to segregate the individual messages. It must also determine which WWIVnet address the message is to be directed to. It should be configurable, allowing for different routing criteria. Input formats are be slightly varied due to the differing types of messages it will process.

See Appendix: PROCUUCP

PROCESS NAME: 2.1 - Analyze/Extract WWIVnet Messages

PURPOSE: To read WWIVnet packets destined for WUGATE and extract packets that can be forwarded. Packets that cannot be processed should be returned to the sender if possible.

INPUT DATA FLOWS: Messages from WWIVnet, Routing Info, System Configuration Info.

OUTPUT DATA FLOWS: Messages with UUCP Addressing

PROCESS DESCRIPTION: Read the WWIVnet packets, looking for routeable packets. Any routing info that is not defaulted is supplied by the Routing Info data flow.

See Appendix: PROCWWIV

PROCESS NAME: 2.2 - Put Messages in UUCP Spool

PURPOSE: Store messages for later transmission.

INPUT DATA FLOWS: Messages with UUCP addressing, System Configuration

OUTPUT DATA FLOWS: Messages for UUCP

PROCESS DESCRIPTION: UUCP stores the messages it handles in a "spool" queue. This process is where WUGATE hands the messages over to UUCP. It is a UUCP function initiated by WUGATE and executed by UUCP.

See Appendix: PROCWWIV

PROCESS NAME: 3.1 - Analyze Outgoing WWIVnet Packet Headers

PURPOSE: Direct outgoing messages in WWIVnet Packets to either the local BBS or to a remote BBS

INPUT DATA FLOWS: Assembled Messages

OUTPUT DATA FLOWS: Packets for Foreign Delivery, Local Outgoing WWIVnet Mail/News

PROCESS DESCRIPTION: This process invokes part of the WWIVnet system. WWIVnet uses two programs to accomplish the task of analyzing incoming packets (NETWORK1.EXE)and posting local messages (NETWORK2.EXE) to the BBS. This process analyzes them using the appropriate WWIVnet programs. Messages destined for other WWIVnet BBS's are forwarded onward through WWIVnet. Messages for the local BBS are passed to the Post Local Messages Process. Messages destined for the UUCP Network are stored in a WWIVnet Packet file for later processing.

See Appendix "WUGATE and WWIVnet Nodes"

PROCESS NAME: 4.1 - Analyze Incoming WWIVnet Packet Headers

PURPOSE: Direct incoming messages in WWIVnet Packets to either the local BBS or to a remote BBS

INPUT DATA FLOWS: Incoming Packets

OUTPUT DATA FLOWS: Local Incoming WWIVnet Mail/News, Packets for Gateway, Packets for Other WWIVnet BBS's

PROCESS DESCRIPTION: See the description for Analyze Outgoing WWIVnet Packets. This process is functionally similar, only it operates on messages going in a different direction.

See also: Appendix "WUGATE and WWIVnet Nodes"

PROCESS NAME: 4.2 - Post Local Messages

PURPOSE: Store messages incoming from WWIVnet in the BBS data files

INPUT DATA FLOWS: Local Incoming WWIVnet Mail/News

OUTPUT DATA FLOWS: Locally Deliverable Messages

PROCESS DESCRIPTION: This process simply invokes the appropriate WWIVnet program (NETWORK2.EXE) that stores local messages in the BBS's message system.

PROCESS NAME: 5.1 - Receive Data

PURPOSE: Obtain incoming messages from UUCP

INPUT DATA FLOWS: Incoming UUCP Xfer Packets, Systems

OUTPUT DATA FLOWS: Spooled Data

PROCESS DESCRIPTION: WUGATE uses the UUCP programs to transfer messages via telephone modem. The industry standard UUCP g-protocol is used to move the data from local and remote computers.

PROCESS NAME: 5.2 - Extract Local Mail/News, Forward Foreign Mail/News

PURPOSE: Analyze incoming messages from UUCP, process local messages or forward messages for remote UUCP hosts

OUTPUT DATA FLOWS: News, Mail, Forwarded UUCP messages

PROCESS DESCRIPTION: Like WWIVnet, UUCP also stores local messages using particular file structures and forwards messages destined for remote systems. This process invokes the necessary programs that are a part of the UUCP system to accomplish this task.

PROCESS NAME: 6.2 - Establish Connection Transmit Data

PURPOSE: Place a phone call to a remote UUCP system and provide connection.

INPUT DATA FLOWS: Spooled Messages, System Info

OUTPUT DATA FLOWS: Outgoing UUCP Xfer Packets

PROCESS DESCRIPTION: If certain criteria are met (See Input Data Flow: System Info, Process: Choose System), the invoked UUCP programs will call a remote system and transfer messages with it.

PROCESS NAME: 6.1 - Choose System

PURPOSE: Select a UUCP system to connect to

INPUT DATA FLOWS: Systems, Presence of spooled messages

OUTPUT DATA FLOWS: System Info

PROCESS DESCRIPTION: If messages are waiting in the UUCP spool queue and other criteria, such as proper time of day are met. This process invokes the program that calls another system based upon the information provided to it. This process provides the information.

PROCESS NAME: 7 - Check if OK to Run now.

PURPOSE: Check to see if a process should run

INPUT DATA FLOWS: Last Hour Ran, Request to process

OUTPUT DATA FLOWS: Last Hour Ran

PROCESS DESCRIPTION: This process reads a table of when regulated processes were last run. It updates the table if the process has not run in Delta hours. It returns a GO/NO decision to the requesting process as to whether it is time to run. This process is useful for regulating very time consuming processes, preventing them from being run too many times during the day.

PROCESS NAME: 8 - Change Hours Between Runs

PURPOSE: Configure the WUGATE system

INPUT DATA FLOWS: Deltas

OUTPUT DATA FLOWS: Updated Deltas

PROCESS DESCRIPTION: This process is for updating the parameter that determines how many hours should be between a regulated process' execution. A generic text editor can be used.

PROCESS NAME: 9 - Change MailBox Configs

PURPOSE: Change contents of data store that holds MailBox forwarding information

INPUT DATA FLOWS: Updated Configs

OUTPUT DATA FLOWS: Existing Config

PROCESS DESCRIPTION: Each MailBox is forwarded to somewhere in WWIVnet. The information needed by WWIVnet to perform this operation is stored here. A generic text editor can be used.

PROCESS NAME: 10 - Change System Config

PURPOSE: Alter WUGATE system configuration

INPUT DATA FLOWS: Existing Configuration

OUTPUT DATA FLOWS: Updated System Configuration

PROCESS DESCRIPTION: The System configuration contains platform dependent and administrative parameters. A generic text editor can be used.

PROCESS NAME: 11 - Change Routing

PURPOSE: Alter Routing of messages

INPUT DATA FLOWS: Existing UUCP routing info, Existing Routing Info

OUTPUT DATA FLOWS: Updated UUCP Routing Info, Updated Routing Info

PROCESS DESCRIPTION: Where certain packets are sent depends upon the routing information. This allows it to be configured. A generic text editor can be used.

DATA FLOWS

DATA FLOW NAME: Batch Email

ALTERNATE NAMES: User Email, Mail

ABBREVIATION:

RECORD: As specified by Waffle BBS requirements

DESCRIPTION: Carry email messages in groups

ORIGIN: D2, 5.2

DESTINATION: 1.1, D2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: News Articles

ALTERNATE NAMES: News

ABBREVIATION: none

RECORD: As specified by Waffle BBS requirements

DESCRIPTION: To carry news articles in groups

ORIGIN: D1

DESTINATION: 1.1

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Batched News

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As Specified by Waffle UUCP requirements

DESCRIPTION: News articles grouped together and compressed to lower transport costs

ORIGIN: 5.2

DESTINATION: D1

VOLUME & FREQUENCY:

DATA FLOW NAME: UUCP Routing Info

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: uu2ww.dat

DESCRIPTION: Carries message routing information, specified by administrator

ORIGIN: D6, 11

DESTINATION: 1.1, D6, 11

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: System Software Configuration

ALTERNATE NAMES: General System Configuration

ABBREVIATION: none

RECORD: config.ksh

DESCRIPTION: Information stored in various files that processes need to work on particular computer platform

ORIGIN: D12

DESTINATION: 1.1, 1.2, 2.1, 2.2, 5.1, 5.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Info About Other Systems

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As Specified by Waffle UUCP requirements

DESCRIPTION: Carries info about other UUCP systems, phone number, time to call etc.

ORIGIN: D10

DESTINATION: 6.1

VOLUME & FREQUENCY:

DATA FLOW NAME: Concatenated Messages

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by UUCP system requirements, RFC-822

DESCRIPTION: Used as common message format to be input to WUGATE

ORIGIN: D11

DESTINATION: 1.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Individual Messages

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by UUCP system requirements, RFC-822

DESCRIPTION: Mail or News messages in RFC-822 format

ORIGIN: 1.1

DESTINATION: D11

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Request to Process

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: none

DESCRIPTION: Used by a regulated process to see if it is time from it to run

ORIGIN: 1.1, 1.2

DESTINATION: 7

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Return GO/NO GO

ALTERNATE NAMES: Request to Process OK

ABBREVIATION: none

RECORD: STATUS

DESCRIPTION: To provide instruction as to whether a requesting process should run.

ORIGIN: 7

DESTINATION: 1.1, 1.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Assembled Messages

ALTERNATE NAMES: Messages Gated to WWIVnetPackets for Gateway, Messages from WWIVnet, Local Incoming WWIVnet Mail/News, Local Outgoing WWIVnet Mail/News Packets for foreign delivery, Packets for other WWIVnet BBS's, Local WWIVnet Mail/News

ABBREVIATION: none

RECORD: As specified by WWIVnet System requirements
WWIVnet Packet Structure.

DESCRIPTION: A stream of messages in WWIVnet packet format
See Appendix WWIVnet Packet Structure

ORIGIN: 1.2, 3.1, 4.1, D4, D3, WWIVnet

DESTINATION: D3, 2.1, 3.1, 3.2, 4.1, 4.2, WWIVnet

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: WWIV->UUCP Routing Info

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: ww2uu.dat

DESCRIPTION: Carries message routing information, specified by administrator

ORIGIN: D7, 11

DESTINATION: 2.1, 11, D7

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Messages with UUCP Addressing

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by UUCP system requirements, RFC-822

DESCRIPTION: Carries messages and addressing information for UUCP

ORIGIN: 2.1

DESTINATION: 2.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Messages for UUCP

ALTERNATE NAMES: Forwarded UUCP Messages, Spooled Messages

ABBREVIATION: none

RECORD: As specified by Waffle BBS UUCP requirements

DESCRIPTION: Messages for UUCP are stored in the UUCP spool area.

ORIGIN: 2.2, 5.2, D5

DESTINATION: D5, 6.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Locally Deliverable Messages

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by WWIV BBS system requirements

DESCRIPTION: Carries messages from WWIVnet packet files into the BBS entity.

ORIGIN: 3.2, 4.2

DESTINATION: BBS

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Incoming UUCP Xfer Packets

ALTERNATE NAMES: Outgoing UUCP Xfer Packets

ABBREVIATION: none

RECORD: As Specified by UUCP g-protocol definition

DESCRIPTION: A vehicle to move data between UUCP nodes with error detection and correction.

ORIGIN: UUCP, 6.2

DESTINATION: 5.1, UUCP

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Spooled Data

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by Waffle BBS UUCP requirements

DESCRIPTION: An intermediate format for incoming UUCP messages

ORIGIN: 5.1

DESTINATION: 5.2

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Presence of Spooled Messages

ALTERNATE NAMES: none

ABBREVIATION: none

RECORD: As specified by Waffle BBS UUCP requirements

DESCRIPTION: Status as t whether UUCP messages are pending

ORIGIN: D5

DESTINATION: 6.1

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: System Info

ALTERNATE NAMES: Systems

ABBREVIATION: none

RECORD: As Specified by Waffle BBS UUCP requirements

DESCRIPTION: Specific info (phone number, baud rate, etc.) about another UUCP system

ORIGIN: D10, 6.1

DESTINATION: 6.1, 6.2, 5.1

VOLUME & FREQUENCY: Indefinite

DATA FLOW NAME: Mailbox Configs

ALTERNATE NAMES: Updated MailBox Configs, Existing Mailbox Configs

ABBREVIATION:

RECORD: *.cfg

DESCRIPTION: Store WWIVnet packet header information etc. for different MailBoxes. Used when forwarding to UUCP

ORIGIN: D13, 9

DESTINATION: 1.2, D13, 9

VOLUME & FREQUENCY:

DATA FLOW NAME: Delta

ALTERNATE NAMES: Updated Deltas, Existing Deltas

ABBREVIATION:

RECORD: delta.dat

DESCRIPTION: Carries information stored in D9

ORIGIN: D9, 8

DESTINATION: D9, 7, 8

VOLUME & FREQUENCY:

DATA FLOW NAME: Last Hour

ALTERNATE NAMES: Updated Last Hour

ABBREVIATION:

RECORD: last.dat

DESCRIPTION: Carries information stored in D8

ORIGIN: D8, 7

DESTINATION: 7, D8

VOLUME & FREQUENCY:

EXTERNAL ENITIES

EXTERNAL ENTITY NAME: BBS

ALTERNATE NAMES: WWIV BBS, WWIV

ACRONYM:

INPUT DATA FLOWS: Locally Deliverable Messages

OUTPUT DATA FLOWS::

DESCRIPTION: Bulletin Board System, in particular, a WWIV BBS

EXTERNAL ENTITY NAME: UUCP

ALTERNATE NAMES: Waffle UUCP

ACRONYM:

INPUT DATA FLOWS: Incoming UUCP Xfer Packets

OUTPUT DATA FLOWS: Outgoing UUCP Xfer Packets

DESCRIPTION: A store and forward computer network. An implementation of UUCP for the Waffle BBS system

---

EXTERNAL ENTITY NAME: WWIVnet

ALTERNATE NAMES:

ACRONYM:

INPUT DATA FLOWS: Packets for other WWIVnet BBS's, Packets for foreign delivery.

OUTPUT DATA FLOWS: Incoming Packets

DESCRIPTION: A store and forward computer network. Defined by WWIVnet Network Documentation.

RECORD NAME: ww2uu.dat

ALTERNATE NAMES:

DEFINITION: WWIVnet to UUCP routing

DATA ELEMENT CONTENT: WWIVnet Input Message type, WWIVnet sub type, UUCP destinatio, UUCP Message forwarding agent

---

RECORD NAME: uu2ww.dat

ALTERNATE NAMES:

DEFINITION: UUCP to WWIVnet routing info

DATA ELEMENT CONTENT: Usenet Group, MailBox Config file

RECORD NAME: last.dat

ALTERNATE NAMES:

DEFINITION: To store hour

DATA ELEMENT CONTENT: Hour

RECORD NAME: delta.dat

ALTERNATE NAMES:

DEFINITION: Store

DATA ELEMENT CONTENT: Hour

RECORD NAME: *.cfg

ALTERNATE NAMES:

DEFINITION: Used to store information as to where in WWIVnet a mailbox should be forwarded. Allows all WWIVnet Packet header information to be specified for each MailBox.

DATA ELEMENT CONTENT:

See Appendix *.cfg for example of implementation

RECORD NAME: config.ksh

ALTERNATE NAMES:

DEFINITION: Stores any relevant pathnames for various programs. Stores WUGATE's WWIVnet node number, Usenet distribution

DATA ELEMENT CONTENT: Pathname(s), WWIVnet Node Number, Usenet Distribution

See Appendix config.ksh for example of implemention

DATA ELEMENT NAME: Usenet Group
ALTERNATE NAMES: News Group
TYPE AND LENGTH:
OUTPUT FORMAT:
DEFAULT VALUE:
PROMPT/COLOMN HEADER:
SOURCE: uu2ww.dat
SECURITY:
RESP. END USER:
ACCEPTABLE VALUES:
OTHER VALIDATION:
DERIVATION FORMULA:
DESC. AND COMMENTS:

DATA ELEMENT NAME: MailBox Config Filename
ALTERNATE NAMES:
TYPE AND LENGTH: Character: XXXXXXXX.XXX
DEFAULT VALUE:
PROMPT/COLOMN HEADER:
SOURCE: System Administrator
SECURITY:
RESP. END USER:
ACCEPTABLE VALUES: Any 12 valid filename chars.
ACCEPTABLE VALUES: The fourth to last character must be a "."
See TYPE & LENGTH
DERIVATION FORMULA:
DESC. AND COMMENTS: This points to a MailBox Config file which contains Mailbox routing info

---

DATA ELEMENT NAME: WWIVnet message type

ALTERNATE NAMES: main type

TYPE AND LENGTH: 20 printable characters or less

OUTPUT FORMAT:

DEFAULT VALUE: Null string

PROMPT/COLOMN HEADER:

SOURCE: System Administrator

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: "mail", "verb", "post"

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: Represents the binary (short integer) *main type* of the WWIVnet packet header.

mail: main type = WWIVnet email

verb: main type = WWIVnet verbose email

post: main type = WWIVnet pre-post

DATA ELEMENT NAME: WWIVnet sub type

ALTERNATE NAMES: sub type, minor type

TYPE AND LENGTH: Numerical, 5 digits

DEFAULT VALUE: Null String

PROMPT/COLOMN HEADER:

SOURCE: System Administrator

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: 5 digits representing a number less than 65535 (base 10)

TYPE AND LENGTH:

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: Every WWIVnet message has a *minor type*. It is used to determine what bulletin area the message is a part of.

See Appendix WW2UU.DAT

DATA ELEMENT NAME: UUCP destination

ALTERNATE NAMES: UUCP address, Usenet Group

TYPE AND LENGTH: Character, typically 5-40

DEFAULT VALUE: Null String

PROMPT/COLOMN HEADER:

SOURCE:

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: The length can be more than stated above. The maximum useable is derermined by external systems

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: UUCP email addresses are of varying lengths. Refer to RFC-822 for details. Usenet groups are typically short strings of printable characters separated by period characters

See Appendix WW2UU.DAT

DATA ELEMENT NAME: UUCP Message forwarding agent

ALTERNATE NAMES:

TYPE AND LENGTH: Character, 10

OUTPUT FORMAT:

DEFAULT VALUE:

PROMPT/COLOMN HEADER:

SOURCE: System Administrator

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: "uumail", "uunews"

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: This element is used in ww2uu.dat to instruct WUGATE how to forward the WWIVnet message. If it is uumail, it is sent as UUCP mail. If it is uunews, it is sent as Usenet news.

See Appendix ww2uu.dat

DATA ELEMENT NAME: Pathname

ALTERNATE NAMES: Directory

TYPE AND LENGTH: Maximum allowed by Operating System

OUTPUT FORMAT:

DEFAULT VALUE:

PROMPT/COLOMN HEADER:

SOURCE: System Administrator

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: Any valid directory name allowed by the O.S.

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: Can be used anywhere a pathname is used. Refer to Appendix config.ksh

---

DATA ELEMENT NAME: WWIVnet node number

ALTERNATE NAMES: WWCP node

TYPE AND LENGTH: Numerical, 5 digits

OUTPUT FORMAT:

DEFAULT VALUE: Null String

PROMPT/COLOMN HEADER:

SOURCE: WWCP node coordinator (refer to WWIVnet documentation)

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES:

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: To represent a valid WWIVnet BBS node number

Refer to Appendix config.ksh

DATA ELEMENT NAME: Usenet Distribution

ALTERNATE NAMES:

TYPE AND LENGTH: Character, 10

OUTPUT FORMAT:

DEFAULT VALUE:

PROMPT/COLOMN HEADER:

SOURCE: System Administrator

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: Refer to Usenet Documentation, acceptable distributions

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: Usenet news can be distributed localy, nationaly, worldwide, etc. This specifies how wide WUGATE will try to distribute outging news.

Refer to Appendix config.ksh

DATA ELEMENT NAME: STATUS

ALTERNATE NAMES: OK/NO GO

TYPE AND LENGTH: Numerical, 1

OUTPUT FORMAT:

DEFAULT VALUE:

PROMPT/COLOMN HEADER:

SOURCE:

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: 0, 1

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: A placeholder for a true/false condition

DATA ELEMENT NAME: Hour

ALTERNATE NAMES:

TYPE AND LENGTH: Numerical, 2

OUTPUT FORMAT:

DEFAULT VALUE: None

PROMPT/COLOMN HEADER:

SOURCE: 7 - Regulate

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: A number from 0 to 24

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: It represent an hour of the day. 24 hour format.

DATA ELEMENT NAME: Delta

ALTERNATE NAMES:

TYPE AND LENGTH: Numerical, 2

OUTPUT FORMAT:

DEFAULT VALUE: None

PROMPT/COLOMN HEADER:

SOURCE: 7 - Regulate

SECURITY:

RESP. END USER:

ACCEPTABLE VALUES: A number from 0 to 24

OTHER VALIDATION:

DERIVATION FORMULA:

DESC. AND COMMENTS: It represent an hour of the day. 24 hour format.

DATA ELEMENT NAME: WWIVnet Packets

ALTERNATE NAMES: none

ABBREVIATION: D3, D4,

RECORD: As specified in WWIVnet system requirements
See Appendix WWIVnet Packet Structure

DESCRIPTION: To store one or more WWIVnet messages.

INPUT DATA FLOWS: Packets for Gateway, Messages Gated to WWIV

OUTPUT DATA FLOWS: Assembled Messages, Messages from WWIVnet

VOLUME & FREQUENCY:

DATA STORES

DATA STORE NAME: NEWS Articles

ALTERNATE NAMES: none

ABBREVIATION:

RECORD: As Specified in Waffle BBS requirements

DESCRIPTION: A set of directories and files used store Usenet News Articles

INPUT DATA FLOWS: Batched News

OUTPUT DATA FLOWS: News Articles

DATA STORE NAME: User Mail

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As Specified by UUCP mail/news format requirements, RFC-822 and Waffle BBS system requirements

DESCRIPTION: Used to store mail messages

INPUT DATA FLOWS: Batch Email

OUTPUT DATA FLOWS: User Email

DATA STORE NAME: UUCP Spool

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As Specified by Waffle BBS requirements

DESCRIPTION: Used to hold messages that are to be forwarded.

INPUT DATA FLOWS: Messages for UUCP, Mail/News for foreign systems

OUTPUT DATA FLOWS: Spooled Messages

VOLUME & FREQUENCY:

DATA STORE NAME: UUCP-WWIV routing Info

ALTERNATE NAMES:

ABBREVIATION:

RECORD: uu2ww.dat

DESCRIPTION: Used to store UUCP to WWIVnet routing parameters

INPUT DATA FLOWS: Updated UUCP routing info

OUTPUT DATA FLOWS: Existing UUCP Routing Info, UUCP Routing Info

---

DATA STORE NAME: WWIV->UUCP Routing Info

ALTERNATE NAMES:

ABBREVIATION:

RECORD: ww2uu.dat

DESCRIPTION: Used to store WWIVnet to UUCP routing parameters

INPUT DATA FLOWS: Updated Routing Info

OUTPUT DATA FLOWS: Existing WWIV Routing Info, WWIV Routing Info

VOLUME & FREQUENCY:

DATA STORE NAME: General System Config

ALTERNATE NAMES:

ABBREVIATION:

RECORD: config.ksh

DESCRIPTION: Used to store hardware/software platform dependent parameters

INPUT DATA FLOWS: Updated System Config

OUTPUT DATA FLOWS: Existing System Config

DATA STORE NAME: Mail Boxes

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As specified by Unix™ mailbox specification

DESCRIPTION: Used to store groups of messages in a common format for easier transfer to WWIVnet

INPUT DATA FLOWS: Individual Messages

OUTPUT DATA FLOWS: Concatenated Messages

DATA STORE NAME: Last Hour Ran

ALTERNATE NAMES:

ABBREVIATION:

RECORD: last.dat

DESCRIPTION: Used to store the last hour a process ran.

INPUT DATA FLOWS: Updated Last Hour

OUTPUT DATA FLOWS: Last Hour

DATA STORE NAME: Run Delta

ALTERNATE NAMES:

ABBREVIATION:

RECORD: Delta.dat

DESCRIPTION: Used to store the parameter that determines the time a process must wait before executing again.

INPUT DATA FLOWS: Updated Run Delta

OUTPUT DATA FLOWS: Deltas, Run Delta

VOLUME & FREQUENCY:

DATA STORE NAME: Mail Box Configs

ALTERNATE NAMES: *.cfg

ABBREVIATION:

RECORD: *.cfg

DESCRIPTION: Used to store WWIVnet forwarding parameters.
Pointed to by data element *config* in uu2ww.dat
See Appendix *.cfg

INPUT DATA FLOWS: Updated Configs

OUTPUT DATA FLOWS: Existing Configs, MailBox Configs

VOLUME & FREQUENCY:

DATA STORE NAME: Systems

ALTERNATE NAMES:

ABBREVIATION:

RECORD: As specified by Waffle BBS UUCP requirements

DESCRIPTION: Part of the Waffle BBS UUCP system. Stores other UUCP system phone numbers, passwords, dialing scripts, etc.
See Appendix SYSTEMS

INPUT DATA FLOWS: Updated Systems

OUTPUT DATA FLOWS: Existing Systems, Systems

VOLUME & FREQUENCY:

APPENDIX - PROCUUCP

```
#########################################################################
# EMACS_MODES: !fill !lnumb
#
# PROCUUCP
#  Copyright 1992-1993 Andrew Gaunt - All Rights Reserved
#  May be distributed freely
#
#
#
#
#
#
#
#########################################################################

NAME="procuucp30"              # this programs name
. config.ksh
echo "${NAME}: UUCP->WWIVnet - Copyright 1992-1993 (C) Andrew Gaunt"
. $WUGATE/bin/clock.ksh $1

if [ "${READY[0]}" = "$TRUE" ]
then
# Scan news groups, turn the newsfiles into mailbox like files for
# later processing with extpost
#set -vx
echo "${NAME}: Scanning news groups: \r\c"
for j in `cat $EXTPOST/uu2ww.dat`
do
        GRP=`echo $j |cut -d":" -f1`
        DIR=`echo $GRP |sed -e's/\./\//g'`
        CFG=`echo $j |cut -d":" -f2`
#       echo "\nGRP=$GRP\nDIR=$DIR\nCFG=$CFG"
        echo "${NAME}: Scanning usenet news: $GRP                \r\c"
        for i in $WUGATE/news/${DIR}/? $WUGATE/news/${DIR}/?? $WUGATE/news/${DIR}/???
        do
                if [ -r "$i" ]
                then
                        echo "\n${NAME}: $i -> $CFG Converting\b\b\b\b\b\b\b\b\b\b\c"
                        cat $i >>"${UUOUT}/${CFG}"
                        #ls -l ${i}
                        rm ${i} && echo "Deleted   \r\c"
                fi
        done
done
echo "${NAME}: Scanning usenet news: DONE                "
#echo
fi


if [ "${READY[1]}" = "$TRUE" ]
```

```
then
# Convert the waffle mailxbox files to a single file mailbox
echo "${NAME}: Converting mailboxes: \r\c"
cd $UUIN
for i in *
do
        if [ -d "$i" ]
        then
                echo "${NAME}: Converting $i                  "
                cat $i/* >>"$UUOUT/$i" && rm -rf $UUIN/$i
        fi
done
echo "${NAME}: Converting mailboxes: DONE        "


# Look for mailbox files that may have been created heretofor from waffle
# mail files and usenet news postings
cd $EXTPOST
#set -x
# use lss because ls craps out on even a short arg list.
for j in `lss -c '*.cfg'`
do
        i=${j:%.cfg}
        if [ -r "$UUOUT/$i" ]
        then
                echo "${NAME}: Mail found for    :  $i        "
                cp $UUOUT/$i $TEMP/$i.txt && mv $UUOUT/$i $WUGATE/old/$i
        fi

        if [ -f "$TEMP/$i.txt" ]
        then
                cd $TEMP
                extpost $EXTPOST/$i.cfg
                rm -f $TEMP/$i.txt
                cd $WWIV
                network1.exe
                network2.exe
                cd $EXTPOST
        else
                echo "${NAME}: Scanning user mail  : $i        \r\c"
        fi
done
echo "${NAME}: Scanning user mail  : DONE     "
fi

if [ "${READY[2]}" = "$TRUE" ]
then
cd $UUOUT
ls *-* >$TEMP/procuucp.tmp 2>nul
cd $EXTPOST
for i in `cat $TEMP/procuucp.tmp`
```

```
do
        if [ -r $UUOUT/$i ]
        then
                echo "${NAME}: WWIV mail found   :  $i        "
                cp $UUOUT/$i $EXTPOST/wwiv.txt && rm -f $UUOUT/$i
        fi

        if [ -f "$EXTPOST/wwiv.txt" ]
        then
                extpost $EXTPOST/wwiv.cfg
                rm -f $EXTPOST/wwiv.txt
                cd $WWIV
                network1.exe
                network2.exe
                cd $EXTPOST
        else
                echo "${NAME}: Scanning wwiv mail  : $i        \r\c"
        fi
done
echo "${NAME}: Scanning wwiv mail  : DONE        "
fi

if [ "${READY[3]}" = "$TRUE" ]
then
echo "${NAME}: Polling UUCP sites :"
UUCICO -d1 -x4 -t60 -r2 -sany
UUXQT
BATCH
#echo "${NAME}: Pollling UUCP sites : DONE   "
fi
```

APPENDIX - PROCWWIV

```
#########################################################################
# EMACS_MODES: !fill !lnumb
#
#
# PROCWWIV
#  Copyright 1992-1993 Andrew Gaunt - All Rights Reserved
#  May be distributed freely
#
#
#
#
#
#
#########################################################################

NAME="procwwiv(3.0)"
. config.ksh
echo "\n${NAME}: WWIVnet->UUCP - Copyright 1992-1993 (C) Andrew Gaunt"

function uumail
{
        cd $WORK
        for j in *.msg
        do
                if [ -r $j ]
                then
                        echo "${NAME}: Sending mail: `cat ${j%.msg}.add` $j"
#                       rmail `cat ${j%.msg}.add` <$j
                        rmail -f`cat ${j%.msg}.wwv` `cat ${j%.msg}.add` <$j
                fi
        done
#       echo "${NAME}: Cleaning work directory"
        rm -f $WORK/*
        cd $WWIV
}

function uunews
{
        cd $WORK
        for j in *.msg
        do
                if [ -r $j ]
                then

                        FROM=`cat ${j%.msg}.wwv`
                        TO=`cat ${j%.msg}.add`
                        echo "${NAME}: Sending news: Group:$TO From:$FROM $j"
                        rnews -f "$FROM" -u"$FROM" -z"$FROM" -n"$TO" -v -d$DIST <$j
                fi
        done
```

```
#       echo "${NAME}: Cleaning work directory"
        rm -f $WORK/*
        cd $WWIV
}

cd $WWIV
network1

#echo "${NAME}: Cleaning work directory"
rm -f $WORK/*

i=${DATA}/s${WWCPNODE}.net

LOGNAME="uucp"
if [ -f "$i" ]
then
        #echo "${NAME}: Saving s${WWCPNODE}.net as s${WWCPNODE}.old"
        # cp ${DATA}/s${WWCPNODE}.net ${DATA}/s${WWCPNODE}.old
        echo "${NAME}: Found $i";LOGNAME=$i

        # Delete junk
        echo "${NAME}: Deleting Junk"
        $WUGATE/bin/extract -type 15 0 $i $TEMP/p.net $WORK
        mv $TEMP/p.net $i
        uumail

        for j in `cat $EXTPOST/ww2uu.dat`
        do
#               echo $j

                GTYPE="`echo $j |cut -d":" -f1`"
                GWWIV="`echo $j |cut -d":" -f2`"
                GUUCP="`echo $j |cut -d":" -f3`"
                GGATE="`echo $j |cut -d":" -f4`"


#       echo "\nGTYPE=$GTYPE\nGUUCP=$GUUCP\nGWWIV=$GWWIV\nGGATE=$GGATE\n"

                case $GTYPE in

                        m*|M*)
        echo "${NAME}: Extracting mail to 1@$WWCPNODE"
        $WUGATE/bin/extract +to $GWWIV ${WWCPNODE} $i $TEMP/p.net $WORK
                                mv $TEMP/p.net $i
                                $GGATE
                                ;;

                        v*|V*|7)
        echo "${NAME}: Extracting verbose mail"
        $WUGATE/bin/extract +type 7 0 $i $TEMP/p.net $WORK
                                mv $TEMP/p.net $i
```

```
                        $GGATE
                        ;;

                pr*|PR*|5)
        echo "${NAME}: Extracting preposts"
        $WUGATE/bin/extract +type 5 $GWWIV $i $TEMP/p.net $WORK $GUUCP
                        mv $TEMP/p.net $i
                        $GGATE
                        ;;

                po*|PO*|3)
        echo "${NAME}: Extracting posts"
        $WUGATE/bin/extract +type 3 $GWWIV $i $TEMP/p.net $WORK $GUUCP
                        mv $TEMP/p.net $i
                        $GGATE
                        ;;

                *)
                echo "\007Unknown type!! $GTYPE";;
            esac
        done
        # Final cleanup
        mv $i ${DATA}/p1.net
        network1
        rm -f $i

fi

cd $WWIV
```

APPENDIX - REGULATE

```
#########################################################################
#
# clock (regulate) - for the lack of a better name.
#
#  Copyright 1992-1993 Andrew Gaunt - All Rights Reserved
#  May be distributed freely
#
# This sets some flags that determine some sort of consequent action
# based on time.
##
#
#
#########################################################################

DELTAFILE=$EXTPOST/delta.dat
LASTFILE=$EXTPOST/last.dat
NOW=`date +%H`
if [ "$1" != "" ]
then
        NOW=$1
fi
#echo NOW=$NOW

# read in user specified delta
i=0
for a in `cat $DELTAFILE`
do
        DELTA[$i]=$a
#       echo DELTA[$i]=${DELTA[$i]}
        ((i=i+1))
done

# read in the last time (hour) things supposedly ran
i=0
for a in `cat $LASTFILE`
do
        LAST[$i]=$a
#       echo LAST[$i]=${LAST[$i]}
        ((i=i+1))
done

# figure out 'next' time and account for 24 hour rollover
i=0
while [ $i -lt ${#DELTA[*]} ]
do
        ((NEXT[$i]=LAST[$i] + DELTA[$i]))
        if [ ${NEXT[$i]} -gt 23 ]
        then
                ((NEXT[$i]=NEXT[$i]-24))
        fi
```

```
#       echo NEXT[$i]=${NEXT[$i]}
        ((i=i+1))
done

# update 'last' if 'next' is due/past due. otherwise leave it be.
i=0
while [ $i -lt ${#NEXT[*]} ]
do
        if [ ${NEXT[$i]} -gt $NOW ]
        then
#               echo "Not ready"
                READY[$i]=$FALSE
        fi

        if [ ${NEXT[$i]} -eq $NOW ]
        then
#               echo "Equal"
                READY[$i]=$TRUE
                LAST[$i]=$NOW
        fi

        if [ ${NEXT[$i]} -lt $NOW ]
        then
#               echo "Ready"
                READY[$i]=$TRUE
                LAST[$i]=$NOW
        fi

        ((i=i+1))
done

# stuff 'ready' array with true/false flags. other programs can read them.
i=0
while [ $i -lt ${#READY[*]} ]
do
#       echo READY[$i]=${READY[$i]}
        case $i in
                0) echo "${NAME}: Net   news: \c";;
                1) echo "${NAME}: Mail boxes: \c";;
                2) echo "${NAME}: WWIV boxes: \c";;
                3) echo "${NAME}: UUCP  Poll: \c";;
                *) echo "${NAME}: Bug!\007 i>3 : ${READY[$i]}";;
        esac
        echo "Last:${LAST[$i]} Next:${NEXT[$i]} Delta:${DELTA[$i]} Now:${READY[$i]}"
        ((i=i+1))
done

# store the 'last' times in a file for next time.
echo "${NAME}: Updating $LASTFILE...\c"
>$LASTFILE
i=0
```

```
while [ $i -lt ${#LAST[*]} ]
do
        echo ${LAST[$i]} >>$LASTFILE
        ((i=i+1))
done
echo "DONE"
```

APPENDIX - WUGATE and WWIVnet Nodes

The following is a concise explanation of WWIVnet and how it works internally with regard to WUGATE.

Every member BBS in WWIVnet has a unique WWIVnet "node number". They are used whenever messages are to be sent from one BBS to another. They are analogous to a "street address" only they are independent of geographical connotation.

WWIVnet is an amorphously structured network, meaning messages can be routed to any number of other WWIVnet BBS's depending on how the logical connections are set up

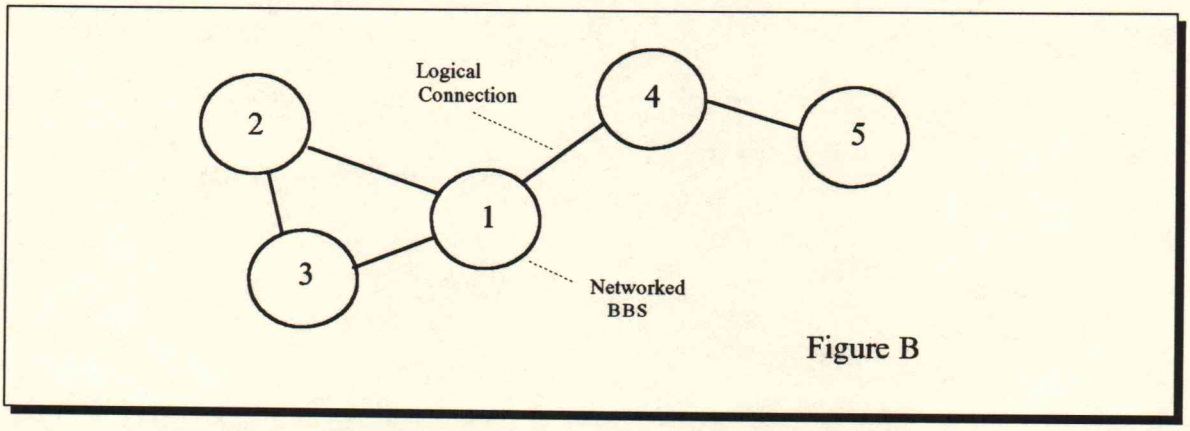


Figure B

Figure B illustrates a WWIVnet type network. Each member BBS is represented by the circles, numbered according to their node number. If a message were to originate from node three and was destined to node five, it would pass through nodes one and four to get there. Each time the messages is passed from one BBS to another, it is takes one network "hop". So, for the preceding example, the message would take three hops to reach its final destination. If it were destined for node one, it would take only

one hop since there is a direct connection between nodes one and three.

Each WWIVnet message is prepended with a message header containing its source node number and final destination node number (along with other related data). When the WWIVnet network software analyzes a WWIVnet Packet file, it examines these message headers and routes them by creating a separate file for the next downstream node (i.e., a connected node that is --by definition-- one hop away). WWIVnet Local messages are placed in a file called local.net. Messages for node number 3 are place in a file s3.net. Messages with an unreachable final destination are placed in a file named dead.net ← How are these resolved? Can they be sent back to originator

WUGATE requires the host (i.e.. the BBS where it is installed) BBS to obtain an additional WWIVnet node number. This new node number is then logically connected (via WWIVnet) to the hosting system and thus, is one "hop" away. When the WWIVnet software analyzes the incoming WWIVnet Packet files, it will create a file name sXXX.net (where XXX represents the node number obtained to run WUGATE). This is the file that WUGATE uses as its incoming WWIVnet Packet file. The file is never actually transmitted to the WUGATE node (via a telephone line) as an ordinary WWIVnet Packet file would be. WUGATE takes the file and processes it.

APPENDIX - WWIVnet Packet Structure

The following is the definition of a WWIVnet packet header from the WWIVnet Network Documentation. The message is appended to the header and its length is specified within the header by *length*. The maximum length of a single message is 32K Bytes long. This is the maximum number *length* will hold.

```
/* From WWIVnet Doc */
typedef struct {
        unsigned short  tosys,          /* destination system */
                        touser,         /* destination user */
                        fromsys,        /* originating system */
                        fromuser;       /* originating user */
        unsigned short  main_type,      /* main message type */
                        minor_type;     /* minor message type */
        unsigned short  list_len;       /* # of entries in system list */
        unsigned long   daten;          /* date/time sent */
        unsigned long   length;         /* # of bytes of msg after header */
        unsigned short  method;         /* method of compression */
} net_header_rec;
```

APPENDIX - CONFIG.KSH

```
WWIV=c:/wwiv                    # WWIV BBS main directory
DATA=c:/wwiv/data               # WWIV BBS's data directory
WUGATE=c:/wugate                # Pathname for WUGATE
WORK=c:/wugate/incoming         # Workspace for Wugate
TEMP=c:/tmp                     # Temporary directory, can be same as WWIV's
WWCPNODE=504                    # Gateway node number
UUIN=c:/wugate/user             # waffle messages here; individual files
UUOUT=c:/wugate/mail            # single file mailboxes, created by procuucp
WWIV=c:/wwiv                    # the WWIV bbs directory
EXTPOST=$WUGATE/wugate          # Pathname for EXTPOST configuration files
DIST="usa"                      # Usenet distribution
                                #   world, na, usa, etc. (see rnews.doc)
TRUE=1                          # General purpose boolean stuff
FALSE=0                         #

#set -x                         # Uncomment this line for debugging
# There should be no need to alter this line
export WWIV WUGATE WORK TEMP WWCPNODE LOGNAME EXTPOST UUIN UUOUT
export TRUE FALSE READY
```

APPENDIX - uu2ww.dat

usenet group: mailbox config file

```
comp.sys.3b1:comp-3b1
alt.bbs:alt-bbs
comp.binaries.ibm.pc:ibm-bin
comp.binaries.ms-windows:win-bin
rec.humor.d:rec-fun
gen.announce:sysop
gen.forsale:gen-sale
```

APPENDIX - ww2uu.dat

wwivnet message type: wwivnet sub type: uucp destination: uucp forwarding agent

```
mail:1::uumail
verb:0::uumail
post:13349:recipe@inforail:uumail
post:56300:libernet@dartmouth.edu:uumail
post:55804:comp.sys.3b1:uunews
```

APPENDIX - *.cfg

```
"C:/WWIV/"
"C:/WWIV/DATA/"
"ROOT.TXT"
"C:/RD1"
"-NONE-"
"-NONE-"
"-NONE-"
"From previous address"
"-"
"From *"
"Subject*:*"
"WWIV[Tt]o:*"
"WWIV[Ff]rom:*"
"6300"
"504"
"1"
"1"
"2"
"0"
"No Subject: line supplied"
"root@inforail.station.mv.com"
```

```
## EMACS_MODES: !fill !lnumb
# pittz       Never g   Hayes2400 toUnix      1201xxxxxxx   uucp     uucp
# lisajous    Any   g   TB19200   toWaffle    245xxxx       UUozone  noogie
#
#
# gsg - Steve Mattin 893-1000
#
#
mvarc Wk2230-0700,Sa,Su0000-1630 g Hayes19200 toWWIV 1-508-960-2226 uucp password
#
station Never g Hayes19200 toWWIV 1-894-5169,,,,, uucp password
#
# nedie      Never  g  Hayes9600n toUnix 1-508-555-1212,,,,, UU_nedie passwd
#
#n8emr      Any COM1 Direct 2400 g "" ATH0 OK AT&D2 OK ATDT1-614-895-2553,,,,,
CONNECT\s2400 "" login:--login: \danonymous word:--word: anonymous


#
```

GLOSSARY

- BBS Common acronym for electronic bulletin board system. It is a system that allows people to send Email to one another, read and post public messages, play interactive on-line games, and a host of other functions.
- Email Slang term often used when referring to any form of electronic mail. Usually involving one of more computer systems.
- Usenet An very loosely formed organization that maintains a system of computers connected in such a way that public messages are shared amongst them. Usenet is so loosely organized that one might think of it as serviceable Anarchy
- UUCP Acronym for Unix to Unix CoPy. UUCP is a vehicle originally developed to allow Unix based computers to transfer information between them. It is also supported by other hardware/software platforms today.
- WUGATE An acronym for WWIVnet to UUCP Gateway. Wugate is a system to exchange information between two incompatible computer networks, WWIVnet UUCP.
- WWIV, WWIV BBS A specific BBS system. It uses WWIVnet as the transport system for networked WWIV BBS systems
- Waffle Waffle is a BBS system that uses UUCP as a network transport system. It is possible to use the UUCP

subsystem of Waffle without the entire Waffle BBS system. WUGATE uses this subsystem.

- Remote, Foreign Refers to systems that are not co-located or are logically removed from the local system. In this document, *foreign* and *remote* are used synonomously.