# Weekend Wiki

## — or how to get organized

Redondo Beach

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Mike Cowlishaw

IBM Fellow

RexxWiki

## Overview

- What’s a Wiki?
- How it works  (mechanics and code)
- Extra features
- Possible enhancements

## What’s a Wiki

- From “wiki wiki” — Hawaiian for *quick*
  - Ward Cunningham,1995
- Allows the creation and editing of web pages using only a browser
- Makes it easy to add links between pages
- Has *shorthand* for markup

## Wiki markup

- Varies by implementation.  Generally has structural markup (lists, *etc.*) and ‘inline’ markup (italic and bold emphasis, *etc.*)

  Example:

```
 * Bulleted list, ''italics''
 * '''Bold item''' -- 10^6
 * And a link to [Another Page]
```

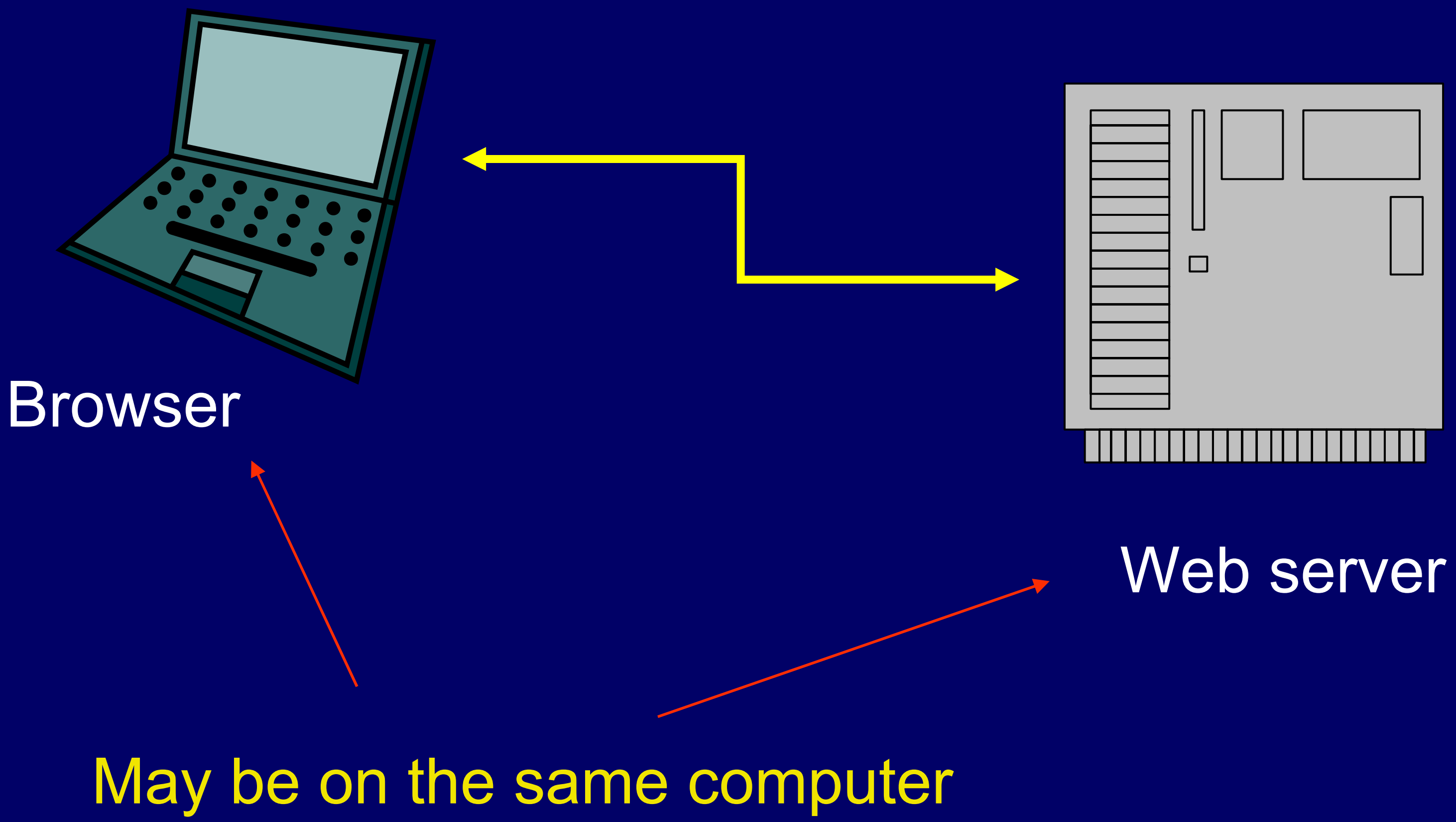
## Markup result

```
* Bulleted list, ''italics''
* '''Bold item''' -- 10^6
* And a link to [Another Page]
```

- Bulleted list, *italics*
- **Bold item** — $10^6$
- And a link to Another Page

(more examples in a moment)

# How does a Wiki work?



## Demonstration

## Why did I write my own?

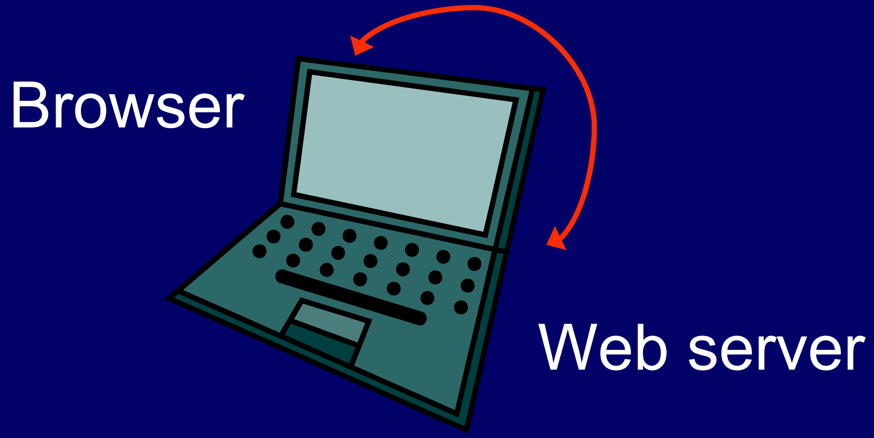
- Most Wikis are built on databases; I wanted to use plain text files, and integrate Wiki pages with other files, references, *etc.*
- I wanted a common Wiki markup for web pages, my notes, and Wikipedia superset
  - allows off-line Wikipedia edit and preview
- I needed to cover multiple projects, with easy interlinking

## Why did I write my own? [2]

- I wanted it to be really fast for core features (pure HTML, no images, no JavaScript)
- I wanted to make ‘publishable’ static snapshots (no need for a web server); see:

  **http://www.cary.demon.co.uk/memowiki/**
- I was in a Rexx programming mood …

# Browser & Web Server



…. on the same computer (address is http://127.0.0.1)

and the server can be written in Rexx …

## A Rexx Web server

```
socket=SockSocket("AF_INET", "SOCK_STREAM", "IPPROTO_TCP")
call SockSetSockOpt socket, "SOL_SOCKET", "SO_REUSEADDR", 1
address.!family="AF_INET"
address.!port=80                 -- HTTP well-known port
address.!addr="INADDR_ANY"
rc=SockBind(socket, "address.!")

signal on halt name halted
client='?'
do forever                       -- handle each request

  /* ---- see next slide ---- */

  end -- forever loop

halted: -- here on Halt break
if client\='?' then call SockClose client
call SockClose socket
```

# Incoming HTTP data stream

Request verb, selector, version

Headers

Empty line

Data (body of request)

```
POST /Cognition/Glossary HTTP/1.1
Accept: */*
Accept-Language: en-gb
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0
Host: 127.0.0.1:8087

textinput=abcdef&action=edit
```

# Web server inner loop

```
do forever
  rc=SockListen(socket, 1)    -- wait for a client
  client=SockAccept(socket, "client.!" )
  data=''
  bytes=SockRecv(client, "data", 1000)
  heads=0
  do forever                  -- get header lines
    parse var data header.heads ('0d0a'x) data
    say heads':' header.heads
    if header.heads=='' then leave -- reached separator line
    heads=heads+1
    end
  say 'data: "'data'"'        -- body remains in data
  reply='<html>Hello, in  <b>bold</b>.</html>'
  rc=SockSend(client, reply, length(reply))
  call SockClose client       -- done with the connection
  client='?'                  -- no active client
  end -- forever loop
```

```
/* Minimal single-thread HTTP server in Rexx.  MFC 2005. */
-- Load all functions
call rxfuncadd sysloadfuncs, rexxutil, sysloadfuncs
call sysloadfuncs
call rxfuncadd "sockloadfuncs", "rxSock", "sockloadfuncs"
call SockLoadFuncs('quiet')

CRLF='0d0a'x        -- useful

/* Get a socket... */
socket=SockSocket("AF_INET", "SOCK_STREAM", "IPPROTO_TCP")
if socket<0 then do
  say 'SockSocket failed:' socket
  return socket
  end
call SockSetSockOpt socket, "SOL_SOCKET", "SO_REUSEADDR", 1


/* Bind... */
address.!family="AF_INET"
address.!port=80              -- HTTP well-known port
address.!addr="INADDR_ANY"
rc=SockBind(socket, "address.!")
if rc<0 then do
  say 'SockBind failed, errno='SockSock_Errno()
  return rc
  end

client='?'
signal on halt name halted

say 'Listening...'

/* Main loop waiting for requests */
do forever

  /* Listen for a request... */
  rc=SockListen(socket, 1)
  if rc\=0 then do
    say 'SockListen error, rc='rc
    return rc
    end

  /* Accept a request... */
  client=SockAccept(socket, "client.!" )
  if client=-1 then do
    say 'SockAccept() failed'
    return -1
    end
```

```
/* Receive the message... */
  data=''
  bytes=SockRecv(client, "data", 1000)
  if bytes<0 then do
    say 'SockRecv() failed'
    return -1
    end

  say client.!family  client.!port  client.!addr', got:' bytes

  -- put header lines into HEADER., with the request in HEADER.0
  heads=0
  do forever
    parse var data header.heads (crlf) data
    say heads':' header.heads
    if header.heads=='' then leave -- reached separator line
    heads=heads+1
    end
  -- here the body of the request (if any) remains in DATA
  say 'data: "'data'"'


  /* Send a reply... */
  reply='<html>'crlf,
        'This is a <b>bold</b> statement.'crlf,
        '</html>'
  rc=SockSend(client, reply, length(reply))

  call SockClose client  -- done with the connection
  client='?'             -- no active client
  end -- forever loop

halted: -- here on Halt break

/* Close sockets and TCP/IP */
if client\='?' then call SockClose client
call SockClose socket
call SockDropFuncs
exit
```

## How is the Wiki programmed?

- Server receives URL (selector):

  **`/MemoWiki/Markup`**

  Page name

  Project name

- May have action, too (up to programmer):

  **`/MemoWiki/Markup?edit`**

# Project and Page names

- Project name is name of a directory (in the MemoWiki data tree)
- Page name is name of a .wiki file stored in the **wiki** subdirectory (or a .ref file in the **refs** subdirectory)

```
d:\wikiroot\MemoWiki\wiki\Markup.wiki
```

## Safe names

- URLs allow only the characters A-Z, a-z, 0-9, `+ - * / . _ @` (and + / @ are reserved)
  - cannot really use `*` and `.` in file names
  - which leaves only `-`, `_`, and alphanumerics
- Use `_` for blanks, `-` for escapes, *e.g.*:

**`My_Page`** **`To-2Ddo_ma-A4ana`**

(To-do mañana)

```
/* ------------------------------------------------------------------ */
/* safe2user - Return human-readable name from safe file/url          */
/*                                                                    */
/*   Arg1 is a safe file/url name                                     */
/*                                                                    */
/* See user2safe for details.                                         */
/* ------------------------------------------------------------------ */
parse arg safe
safe=translate(safe, ' ', '_')          -- any blanks
out=''
do forever
  p=pos('-', safe)
  if p=0 then leave                     -- no more escapes
  parse var safe pre =(p) +1 hex +2 safe
  if datatype(hex, 'x') then ins=x2c(hex)   -- valid escape
                      else ins='-'hex     -- bad: leave as-is
  out=out||pre||ins
  end
return out||safe
```

```
/* ------------------------------------------------------------------ */
/* user2safe - Return safe file/url ID given a human-readable name    */
/*                                                                    */
/*   Arg1 is any string                                               */
/*                                                                    */
/* URLs allow only the characters + - * / . _ @ and alphanumerics.    */
/*                                                                    */
/* URIs reserve (of these) + / @                                      */
/*                                                                    */
/* Windows files do not safely allow (of these) * and .               */
/*                                                                    */
/* Therefore only - and _ are available.  The transformation we use   */
/* to generate safe names is therefore:                               */
/*                                                                    */
/*   Alphanumerics are unchanged                                      */
/*   Blanks -> underscore                                             */
/*   All others -> -xx  [hex escape, system page encoding]            */
/* ------------------------------------------------------------------ */

parse arg data
alphanumb=' abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890'
out=''
do forever                              -- generate escapes
  v=verify(data, alphanumb)
  if v=0 then leave
  parse var data ok =(v) char +1 data
  if v=1 then ok=''                     -- matched end of string
  out=out||ok'-'c2x(char)
  end
return translate(out||data, '_', ' ')
```

## ViewPage.rex

- Calls Header to write header to output file (**`Markup.html`**, in **`\MemoWiki\#cache`**)
- Calls RenderPage to render page content
  - which calls wiki2html to generate HTML from the **`Markup.wiki`** source file
- Writes standard footer to output file
- Returns to server, which sends the output file to the browser

## EditPage.rex

- Calls Header to write header to output file
- If previewing, calls RenderPage to render page content
- Adds a text input box with content of the **`Markup.wiki`** file (form set to use POST)
- Writes standard footer to output file
- Returns to server, which sends the output file to the browser

# ReplacePage.rex

- Saves the current **`Markup.wiki`** file in the archive (**`\MemoWiki\#archive`**)
- Writes a new **`Markup.wiki`** file from the data (body of the request) from the browser
- Cleans the archive for the page (optional)
- Returns to server, which redirects the browser to *view* the page …

## Redirecting the browser

- Sends a ‘302’ response:

```
HTTP/1.0 302 Moved Temporarily
Location: http://127.0.0.1:8087/MemoWiki/markup

<!doctype html public "-//IETF//DTD HTML 2.0//EN">
<html><head><title>Moved</title></head>
<body><h2>Document moved...</h2>
<p>This document has moved.
</body></html>
```

(Browsers don’t usually show the HTML)

## Directory Structure

- **`WikiRoot`**

| | |
|---|---|
| – **`#server`** | web server and .rex files |
| – **`#temp`** | for one-off html files |
| – **`MemoWiki`** | project directory |
|     – **`wiki`** | **`.wiki`** files |
|     – **`refs`** | **`.ref`** files |
|     – **`files`** | general files |
|     – **`#cache`** | re-usable HTML files |
|     – **`#archive`** | saved (old) pages |

## Actions (page level)

- View
- Edit
- View printable (no buttons)
- Google  (Web or Scholar)
- History of this page
- Links to this page

## Actions (project level)

- Go to home page (`/Project/Project`)
- Search pages
- Add or view page (‘go to page’)
- Add a new reference
- Compact index of pages
- Recently changed pages / pages by date
- Clean up archive
- Build static snapshot

## Actions (top level)

- List projects
- Add a new project
- Help (also at lower levels)
  – simply views a page in MemoWiki project
- Explore all
  – also available at project level
- Server maintenance
  – special commands to server

## Demonstration

## Helper code – num2word

- For better messages, for example:

  **Five references:** bert2006‡, fred1998, fred1999b, rapp2002*, smith2001b.

  One reference has its named file missing, indicated by a ‡ mark. Three references have no associated file.

# num2word

```
/* ---------------------------------------------------------- */
/* num2word - number, or word for number if 1-10              */
/*                                                            */
/*   Arg1 is an integer                                       */
/*   Arg2 is 1 if the first letter should be a capital        */
/* ---------------------------------------------------------- */
num2word:
  parse arg num, cap
  if num>10 then return num

  nums='one two three four five six seven eight nine ten'
  text=word(nums, num)

  if cap\=1 then return text
  parse var text c1 +1 rest
  return translate(c1)rest
```

# Wiki2html tips

- Outer loop splits out tags, links, and text

  ```
  text <tag> more text [link] remaining text
  ```

- Tags are passed straight through to output HTML file

- Links are converted to
  ```
  <a href="...">content</a>
  ```

## Wiki2html tips – text segments

- Text segments are processed by splitting into lines (special characters at start of lines indicate structural markup)

- Structural markup processed as needed (generate headers, lists, *etc.*)

- Text is finally passed to a ‘textout’ routine, which handles inline markup (italics, *etc.*)

# Wiki2html tips – text output

- Accents: fum~e’ → `fum&eacute;` → fumé
- then quotes: ‘single’, “double”, it’s
- superscripts: 10^6 → `10<sup>6</sup>` → $10^6$
- the rest are easy substitutions:

```
text=changestr('--', text, '&ndash;')
```

## Other features one could add…

- Compare page versions (‘diff’)
- Multiple (identified) users – probably would be worth adding database for that
    - users’ preferences, contributions, watchlist
- … see other Wikis (*e.g.*, Wikipedia) for more ideas

## Questions?

For documentation, see:

**http://www.cary.demon.co.uk/memowiki/**

**(Google: memowiki)**