LCSR

• Support arm of the Division of Computer and Information Sciences at New Brunswick
• Responsible for DCIS instruction, research, and administration infrastructure
• Maintains and manages
  – software, hardware, and accounts for 10,000 student enrollments annually
  – research infrastructure for research grants totaling over $4M annually
LCSR
Software Systems Developed

• Info system
• Computer Lab login system
• Accounting and Purchase Order system
  – used by LCSR, RUCS, School of Nursing, for about 10 years
• Reservation system (rooms, equipment), Vacation Management, Student Vouchers, Help system
  – Used by DCIS for 5 years
• Virtual OS lab (“hands on access” to kernel)
  – Deploying for graduate and undergrad OS courses
LCSR
Software Systems Developed

• Communigate mail (IMAP server, fail-over architecture)
  – LCSR implemented adaptations
    • Virus protection (Communigate)
    • SPAM filters (all DCIS machines)
  – Used by DCIS for 3 years

• Wireless (LAWN)
  – 18 month of operational experience
  – 85,000 sq ft coverage (two buildings, 7 floors)
  – 20 access points, 125 users - undergrad, grad, faculty, staff
  – One authentication server, one firewall
Communigate mail

- SSL based IMAP, POP, SMTP, Web Mail
- Works with all IMAP/POP clients.
- [http://www.stalker.com](http://www.stalker.com)
  - $1,500 one time fee for 2000 users
  - Can be used without charge (advertising included)
- [http://dragon.rutgers.edu](http://dragon.rutgers.edu)
Mail - Virus handling

• Developed by LCSR
• Refuses executable enclosures
  – For example, *.exe, *.???
  – Receiver is NOT notified
    • design decision
  – Sender is notified of refusal
    • Instruction how to transmit are provided
• Refused roughly 20,000 viruses this year.
• http://please.rutgers.edu/show/viruswarning
Mail – SPAM handling

• Uses spamassassin
  – [http://www.spamassassin.org](http://www.spamassassin.org)

• Feature-based analysis
  – Analyzes content and headers
  – Computes a SPAM rating and thresholds

• SPAM rating added to the message header
  – Message is not rejected by mail server
SPAM augmented header

Return-Path: <makmur@cs.rutgers.edu>
Received: by dragon.rutgers.edu (CommuniGate Pro PIPE 3.5.9) with PIPE id 3868461; Wed, 11 Sep 2002 18:25:32 -0400
X-Spam-Status: Spam Scanned
Received: from [128.6.168.41] ([128.6.168.41] verified) by dragon.rutgers.edu (CommuniGate Pro SMTP 3.5.9) with
ESMTP-TLS id 3868457 for dsmith@cs.rutgers.edu; Wed, 11 Sep 2002 18:25:29 -0400
User-Agent: Microsoft-Entourage/10.1.0.2006
Date: Wed, 11 Sep 2002 18:25:29 -0400
Subject: Sample of the spam headers
From: Hanz Makmur <makmur@cs.rutgers.edu>
To: Don Smith dsmith@cs.rutgers.edu
Message-ID: <89A53B19.9056%makmur@cs.rutgers.edu>
Mime-version: 1.0
Content-type: text/plain; charset="US-ASCII"
Content-transfer-encoding: 7bit
X-Spam-Status: Yes, hits=8.1 required=5.0 tests=SECTION_301, CLICK_BELOW, REMOVE_IN_QUOTES,
A_HREF_TO_REMOVE version=2.11
X-Spam-Flag: YES
X-Spam-Report: 8.1 hits, 5 required; * 1.6 -- BODY: Claims compliance with SPAM regulations
* 0.9 -- BODY: Asks you to click below
* 2.1 -- BODY: List removal information
* 3.5 -- BODY: Link to a URL containing "remove"
Communigate mail SPAM handling

• Users can automatically filter messages
  – SPAM rating filter
    • Message routed to SPAM folder - recommended
    • Delete message – can discard legitimate mail
  – Other possible filters
    • Sender filter
    • Topic filter
    • Blacklisted sites

• http://please.rutgers.edu/show/spamfilter
LAWN
Local Area Wireless Network

DCIS/LCSR
Wireless Zone

This area has wireless coverage using an 802.11b (Wi-Fi) network.

http://please.rutgers.edu/show/wireless
wireless@dcis.rutgers.edu

Laboratory for Computer Science Research
Division of Computer and Information Sciences
Rutgers University
LawnUsage

Number of Users Logged in

Number of Occurrences
LAWN
Design Goals

• Designed for a university environment
  – Distributed control of infrastructure
    • Authenticate against trusted servers
  – Research and infrastructure coexist
    • Six cooperating 802.11b networks sharing our space
  – Hassle free network access for visitors
    • Workshops, visiting collaborators, etc.
  – Support encryption - don’t require it
Rutgers University Local Areal Wireless Network (LAWN) Design

Brought to you by Rutgers University - Laboratory for Computer Science Research Computing Facility
Designed by Hariz Makmur - makmur@cs.rutgers.edu (4.2001).
Modified 11/28/2001
LAWN

• One size doesn’t fit all, especially in a university environment
  – Authenticators cannot be identical
    • A wants access granted only to A student/staff
    • B wants access granted only to B student/staff
    • C wants access to both A and B student/staff

• A variety of clients is necessary.
  – WIN95, WIN98, WINME, WIN2k, XP, OS9, OSX, Linux, and Wireless PDAs (e.g., IPAQ, WinCE)
LAWN Authentication

• All authentication transactions are secure
   • Identify yourself and your authentication server
   • Provide password

• User is authenticated against the identified authentication server

• User must know network name (SSID)
LAWN encryption

• LAWN supports many user-chosen security protocols
  – WEP – not recommended
    • LAWN is not reliant on WEP
  – VPN, ssh, ssl supported and recommended
    • Clients use their preferred security
    • Built in security is redundant
      – can be problematic (e.g., remote VPNs)
LAWN for wired connections

- Ideal for wired computer labs
- Functionally identical to wireless
  - Provides higher bandwidth
  - eliminates RF interference issues.
- Security is identical to wireless
  - Special built-in security for wireless can be confusing
Services over wireless

Wireless services are supported

- Uses one-to-one NAP translator
- Not recommended but easily handled
LAWN Management
adding authentication servers

• Uses text tables
  
  | math, math.rutgers.edu | : math.rutgers.edu |
  | dimacs, dimacs.rutgers.edu | : dimacs.rutgers.edu |
  | mail.cs.lafayette.edu | : mail.cs.lafayette.edu |

• Support authentication methods
  – kerberos, radius, imap(secure, insecure), pop3 (secure, insecure), plaintext password file

• Working on
  – SMB/CIFS, LDAP
Security Issues

• Deny access to insecure paths
  – Disable telnet, ftp, and other insecure protocols
  – RUCS is taking this approach with servers

• Don’t require provider specific security
  – Visitors and collaborators are constrained
  – RU users may need multiple clients
Summary

• Virus and SPAM aware mail system
• Wireless environment
  – uses trusted, distributed, authentication servers
  – user functionality most crucial aspect
    • visitors and collaborators must be more than guests
  – security is user’s responsibility
    • encryption is supported but not required