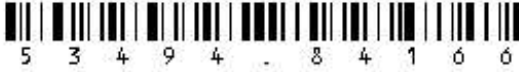# SDSU MASTERS of HOMELAND SECURITY

GEOL600 SENSOR NETWORKS

NETWORK IMPLEMENTATION (2)

Network Example: EVDO ICS

Step1: Logistics

Step2: Build Network

Internet Connection Sharing

Network details

EVDO Keep-alive

# NETWORK EXAMPLE : EVDO / ICS

Situation:
Semi Remote location,
no cable service to location
ADSL connection time estimated at 6 months,
no telephone connection
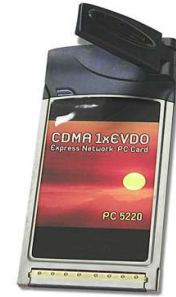1/4 signal strength on EVDO

Require:
LAN access to Internet

Resources:
3 laptop computers, 2 desktop computers, 1 file server
1 usb wifi adapter,
1 pcmcia wifi adapter,
1 pci wifi adapter
2 CAT5 cables
DL-614 802b wifi router w. 4 port 10/100 switch
3G EV-DO pcmcia modem
3dBi 800MHz-3GHz external antenna
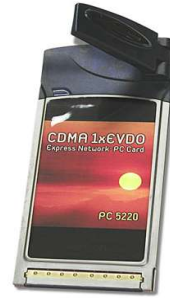
Step 1 : LOGISTICS

Step 2 : BUILD NETWORK

INTERNET CONNECTION SHARING (ICS)

Internet Connection Sharing made its debut in Windows 98 Second Edition, and has been built-in to every successive Windows O$: Me / 2K / XP.
It allows two or more networked computers to share a single Internet connection, whether it is DSL, ISDN, Cable, T1, satellite, or dial-up.

ICS Wizards that come with 98SE / ME can break your Internet Connection. Not hard to set up if done properly.

Setting up ICS (Win98) : www.annoyances.org/exec/show/ics_98

Commercial ICS software (winGate, winProxy) is also available if MS-ICS option unappealing or not working properly.

Setting up ICS (WinXP)
www.annoyances.org/exec/show/ics_xp

Required hardware:

At least 2 computers, all with functioning NICs
Computer sharing the connection may require 2 NICs depending on connection method to Internet
Computer with the Internet connection must be running a version of Windows that supports Internet Connection Sharing.
There is no minimum connection speed
Remember that when two users are downloading using shared connection simultaneously, each user will experience half of the original performance. You probably don't want to share a 9.6k analog modem connection.
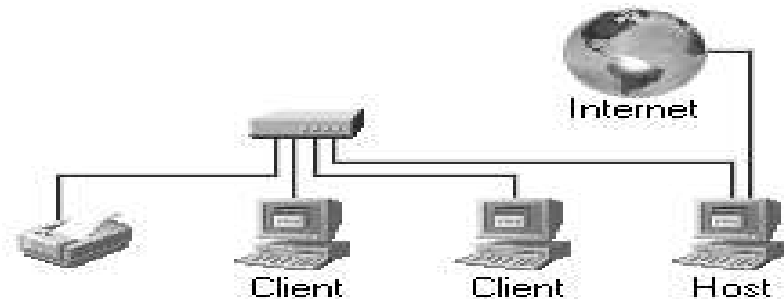
Configure host:

Control Panel > Network Connections > Properties
or
right click 'My Network Places' > Properties

At least 2 connections should be listed,
named by default with their device names.

Right click on adapter through which connection to
Internet is available, select Properties

Internet Protocol (TCP/IP) and
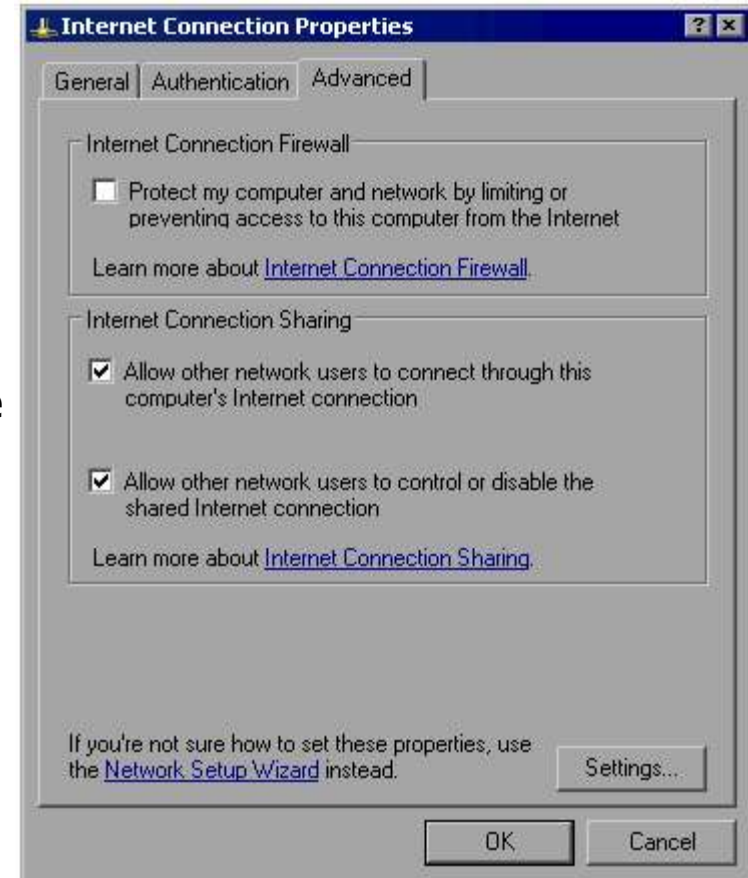Client for MS Networks should be checked.

Choose sharing tab

Enable ICS for this connection

If all is working properly, connection should be
marked with a little black check mark, and its
status change to "**Connected, Shared**"

Configure clients:
Enable DHCP IP address and DNS allocation

NETWORK DETAILS

EVDO Gateway:
Routable IP , open to world

ICS
host address: 192.168.0.1
DHCP server: cant change class C

DI614 ROUTER:

 ICS DHCP allocated WAN port address
DHCP server WiFi / wired connections

 Same class C pool (fixed)
 (Double NAT'ing)

CLIENTS:

WiFi
DHCP clients (802.11b – 11Mbps)

Wired
Fileserver DHCP Client (100 Mbps)

EVDO KEEP-ALIVE

Some websites provide web pages intended to keep evdo connection active. These consist of small pages with META Refresh tags set to small time intervals.

Principle is to have a continuous but not over taxing demand for bandwidth.

Have observed temporary IP blocks to some rapid refresh pages for the existing connection. Resetting connection and getting new evdo IP address resolves issue.

Another method is to connect to internet broadcast radio, obviously want to find a stream with smallest bitrate to minimize impact on shared connections on LAN.

Provides excuse for listening to radio streams in NOC (audio monitoring of network status) and displaying audio visualizations (visual at a glance monitoring)

(whilst laptop can be used as a direct internet terminal, the double natting prevents it from accessing the internal network, in addition to client side firewalls providing protection for each machine)