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Failover Switching Tests Between Two RF Communications Links

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This work presents a short report on the routing tests of the Ku band satcom and VHF line-of-sight communications systems on the Advanced Air Transportation Technologies (AATT) Aero/Mobile van.

The first section is a description of the equipment used, followed by descriptions of the tests, the theoretical results, and finally, conclusions and the actual data.

Background:

Future aeronautical communications systems will probably rely on more than one physical communications link for all traffic. Various radio systems such as HF, VHF, L-band satcom and even Ku-band satcom have all been demonstrated and used before. These tests were an attempt to demonstrate the feasibility to route traffic through two communications links with very different physical characteristics. Both Ku-band satcom (through a geosynchronous satellite) and VHF line-of-sight systems were used both individually (as a baseline) and in mixed configurations (transmit on one link, receive on the other).

Also, failover tests were performed, wherein one link is deliberately shutdown, and the session is dynamically transferred to the other link.

Equipment Descriptions:

Satcom System

The satcom subsystem of the mobile satcom/VHF terminal used commercial Ku-band satellites and provided full duplex connectivity to a fixed station (located at NASA Glenn). The airborne (or mobile) host computers were connected into the Glenn network, and appear as local machines.

The aeronautical terminal design was based around earlier fixed and shipboard reflector antenna terminals built at NASA Glenn, but incorporated a set of electronically-steered receive and transmit phased-array antennas *(PAAs)*. These were purchased from the Boeing Company.

The PAAs are normally configured for frequency, polarization and longitude of the satellite to be used. The antenna control system takes the position data and platform attitude data and calculates the correct pointing angle for both the transmit and receive arrays. The platform position and attitude data are derived from an ARINC 429 interface from the laser gyro/GPS system on the van, or directly from an aircraft INS (*inertial navigation system*) system (on a ARINC 429-equipped aircraft).

Unfortunately, there was some major problems with the phased-array antenna system, and we were forced to conduct the tests using a small (90 cm) fixed reflector antenna system. The performance of the fixed antenna system was comparable to the phased array system.

At the *mobile* side of the system (the aero-mobile van), the received downlink RF signal was downconverted and directed to a commercial satellite modem (Comstream CM701) for demodulation. The demodulated data stream was then routed to a Cisco router, which served as a gateway for hosts connected to the terminal.

Similarly, the uplink data stream from airborne hosts was routed through the Cisco router to a semi-custom spread spectrum modem (based on an L3 EB200 development system), into an upconverter and then through the transmit antenna.

The spread spectrum modulation was used on the airborne uplink to mitigate adjacent satellite interference due to the wide beamwidth of the transmit array.

The *fixed* (ground) side of the system consisted of a complimentary terminal located at NASA Glenn. Since the fixed station used an 8 m antenna, there was no need for the spread-spectrum modulation, and the roles of the two modems (the Comstream CM701 and the L3 EB200) were reversed, i.e., the data stream *from* the mobile station was received by the EB200, and the CM701 was used to source data *to* the mobile terminal.

VHF System

The VHF subsystem consisted of a pair of commercial VHF packet modems (Teledesign TS4000 VHF data radio).

The Teledesign system was configured for full-duplex operation. Each side of the system consisted of two radios; one used as a receiver (demodulator) with the other used as a transmitter (modulator). On the mobile side, the modem RF ports were connected to a TX/RX Systems duplexer, and from there to a Comtelco VHF antenna mounted on the roof of the AATT aero-mobile communications Van. The fixed side utilized the same system design with the exception that the duplexer was connected to an omnidirectional antenna at a height of about 9 m. Transmit power levels on both sides were set at 34 dBm. RF Data rates were set to 19.2 kb/s.

The mobile and fixed stations each had a single Cisco 3640 router. The two routers were connected via independent satcom and VHF data paths. The routers function was to route packets from the source host onto the selected data path to the destination host. The data path was selected based on weighted routing tables. The primary data path was the route with the lowest cost.

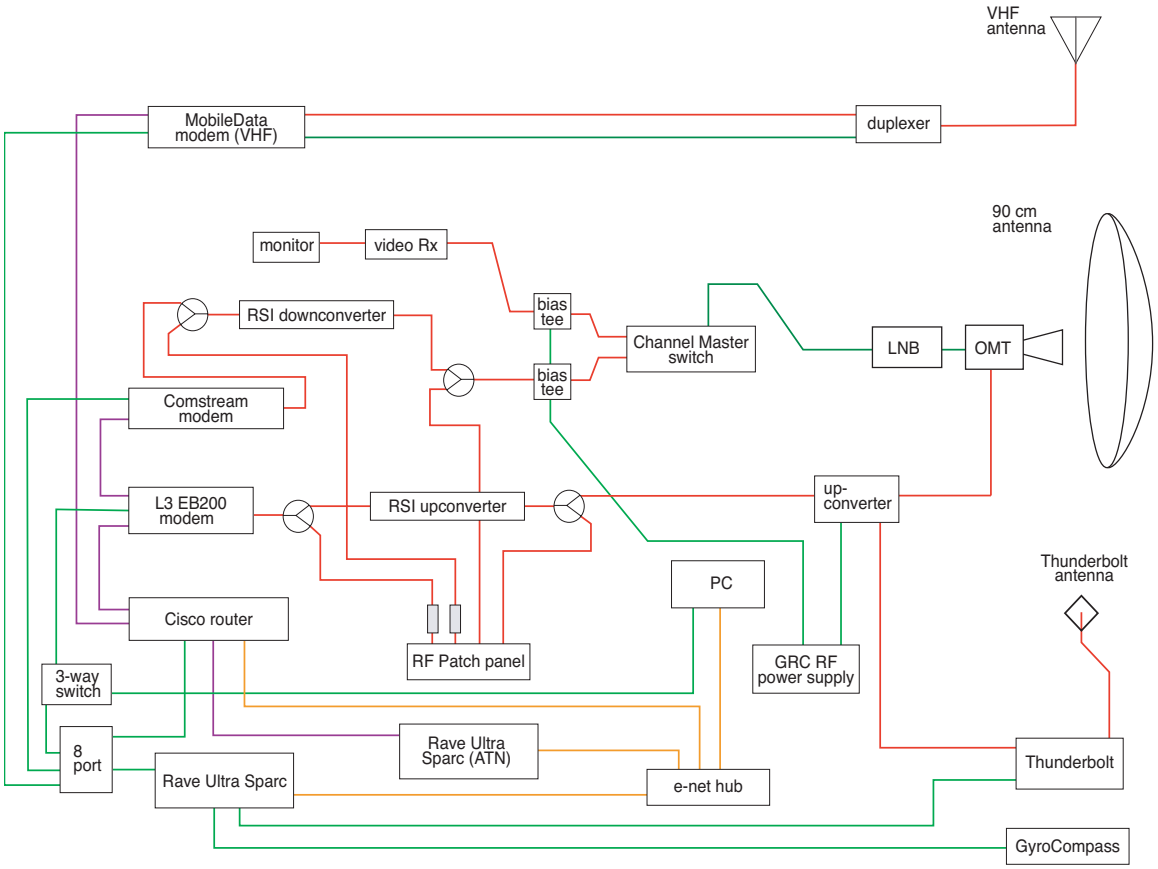

Figure 1: Block diagram of mobile Satcom/VHF terminal

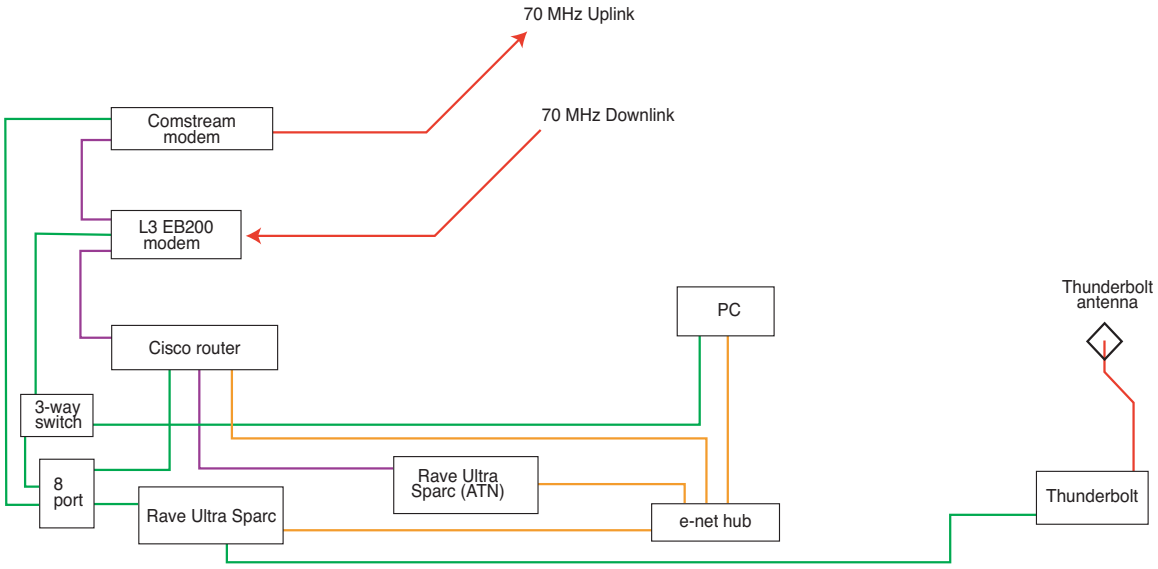

Figure 2: Block diagram of fixed Satcom/VHF terminal

General Performance Parameters

The general performance parameters of the terminal are:

Ku-band uplink
frequency: 14. 0 - 14.5 GHz
number of elements in the Tx array: 254
EIRP: 36 dBW
modulation: QPSK with direct-sequence spread spectrum, up to 512 kb/s
error-correcting coding: 1/2 rate convolutional
spreading: to 10 MHz

Ku-band downlink
frequency: 11.75 - 12.25 GHz
number of elements in the Rx array: 1536
G/T: 34 dB/K
modulation: QPSK, up to 4 Mb/s
error-correcting coding: 1/2 rate convolutional, rate 235/255 Reed-Solomon

VHF datalink
frequency: 139.110 and 141.965 MHz
data rate: 19.2 kb/s (nominal)
modulation: GMSK
output power: approximately 4 dBW
no error-correcting coding

Test Descriptions:

The goal of these tests was to attempt to measure the actual data throughput on each set of connections, and to demonstrate the ability of the system to "failover" ("hot switch") from a primary to a secondary link.

The *Iperf* tool was used to measure the instantaneous throughput rate, but this application does have some problems. Unfortunately, it is still probably the best available tool for this purpose.

The testing consisted of two parts:

(1) a standard set of IP tests with fixed routing, and
(2) *iperf* testing with failover between the satcom and VHF links

The standard test set consists of:
(a) pings (b) ttcp, and (c) iperf.

ping
A “ping” is an ICMP (Internet Control Message Protocol) packet of variable length sent from one host to another and then sent back to the originator of the ping. The existence of, and round trip time of the acknowledgment are reported.

“pings” of length 64, 512, 1024, 2048, and 4096 bytes were sent between the fixed and mobile hosts.

More information about “ping” can be found at <*http://www.faqs.org/rfcs/rfc792.html*>.

TTCP
TTCP is a performance measurement tool for TCP links. It provides a measurement of user data throughput rate--which can be highly dependent upon the delay*bandwidth product. With the long geosynchronous satellite delay, this becomes an issue.

More information can be found at
<*http://www.nas.nasa.gov/Groups/LAN/ClassNotes/ant/ttcp.html*>.

Iperf
Iperf is a network performance measurement tool similar to ttcp. It is used to measure maximum TCP bandwidth, allowing the tuning of various parameters and UDP characteristics. Iperf reports bandwidth, delay jitter, datagram loss.

Iperf was written as a modern replacement for older tried and true tools, such as ttcp, but with options to support more recent network features and enhancements.

More information can be found at <*http://dast.nlanr.net/Projects/Iperf/*>.

Routing configurations

There are four routing configurations tested:

	fixed-to-mobile link	*mobile-to-fixed link*
(1)	satcom	satcom
(2)	VHF	VHF
(3)	satcom	VHF
(4)	VHF	satcom

There are actually sixteen log files from the four configurations. For each test session we logged both receive and transmit data. Each test was run primarily in one direction which required us to run two tests for each direction of a given routing configuration. Each test then generated two logs, one for transmit, and one for receive.

The log files are attached (*Appendix B*) and are labeled as follows:

<month>_<day>_<site>_<local-uplink>_<remote-uplink>_<test-direction>

month: Three letter abbreviation of the month the test was run.

day: Two numbers denoting the day the test was run.

site: Fixed (fxd), or Mobile (mob)

local-uplink: Satcom (sat), or VHF (vhf)

remote-uplink: Satcom (sat), or VHF (vhf)

test-direction: Data sample of the Receive (rx) or Transmit (tx) side of the local interface.

"*feb_05_fxd_sat_sat_rx*" would imply a test run on February 5th, at the Fixed station, with Fixed station satellite uplink paired with Mobile station satellite downlink, Mobile station satellite uplink paired with Fixed station satellite downlink, and logging data on the receive side of the fixed station.

The tests were performed over a period from February 5 through February 26, 2003.

IP Test Results

All links functioned normally. The throughput rates are similar to those calculated in Appendix A. Results are summarized below in Table 1.

Table 1: Summary of Throughput for Static Links

configuration 1:

link segment:	fixed-to-mobile	mobile-to-fixed
physical link:	satcom	satcom
ttcp throughput[1]:	1780	230
iperf throughput[2]:	1900	243
log files:	*feb_05_mob_sat_sat_rx*	*feb_05_fxd_sat_sat_rx*
	feb_05_fxd_sat_sat_tx	*feb_05_mob_sat_sat_tx*

configuration 2:

link segment:	fixed-to-mobile	mobile-to-fixed
physical link:	VHF	VHF
ttcp throughput[1]:	10	10
iperf throughput[2]:	14.8	14.8
log files:	*feb_05_mob_vhf_vhf_rx*	*feb_05_fxd_vhf_vhf_rx*
	feb_05_fxd_vhf_vhf_tx	*feb_05_mob_vhf_vhf_tx*

configuration 3:

link segment:	fixed-to-mobile	mobile-to-fixed
physical link:	satcom	VHF
ttcp throughput[1]:	940	10
iperf throughput[2]:	1250	14.6
log files:	*feb_05_mob_vhf_sat_rx*	*feb_05_fxd_sat_vhf_rx*
	feb_05_fxd_sat_vhf_tx	*feb_05_mob_vhf_sat_tx*

configuration 4:

link segment:	fixed-to-mobile	mobile-to-fixed
physical link:	VHF	satcom
ttcp throughput[1]:	10	240
iperf throughput[2]:	14.6	235
log files:	*feb_05_mob_sat_vhf_rx*	*feb_05_fxd_vhf_sat_rx*
	feb_05_fxd_vhf_sat_tx	*feb_05_mob_sat_vhf_tx*

[1]*--average throughput, in kb/s*
[2]*--average instantaneous throughput, in kb/s*

Failover Tests

These tests were designed to demonstrate the simultaneous use of more than one physical link. In this case these were the satcom link and the VHF link. These two links had very different characteristics—the satcom link had a very wide bandwidth (256 to 2048 kb/s) and a long delay (about 250 msec for each direction). The VHF link was line-of-sight, with extremely short delay, and narrow bandwidth (only about 19.2 kb/s).

The router was configured to utilize either the satcom or the VHF link as primary, with the other as secondary. The primary link was interrupted, and traffic was re-routed through the secondary link. An *iperf* session was run during the test to observe the results.

Failover Test Results

The failover tests consisted of running the system through the satcom link for several minutes, shutting down the satcom link, and letting the system reconnect through the VHF system. After the VHF connection settled, we shut it down and then let the system reconnect through the satcom system. The *iperf* tool was used to measure the instantaneous throughput.

The initial throughput rate was measured at about 1900 kb/s. After the failover from satcom to VHF, the data rate settled out at about 14.8 kb/s. After failover back to the satcom system, the TCP slow-start could be observed, with the throughput rate climbing from 14.8 back to 1900 kb/s over a period of about 100 seconds.

Two test were performed. The data from each set is displayed in the graphs which follow. The log files containing this data are:
feb_26_mob_sat_sat_rx_failover.4 and *feb_26_mob_sat_sat_rx_failover.5*

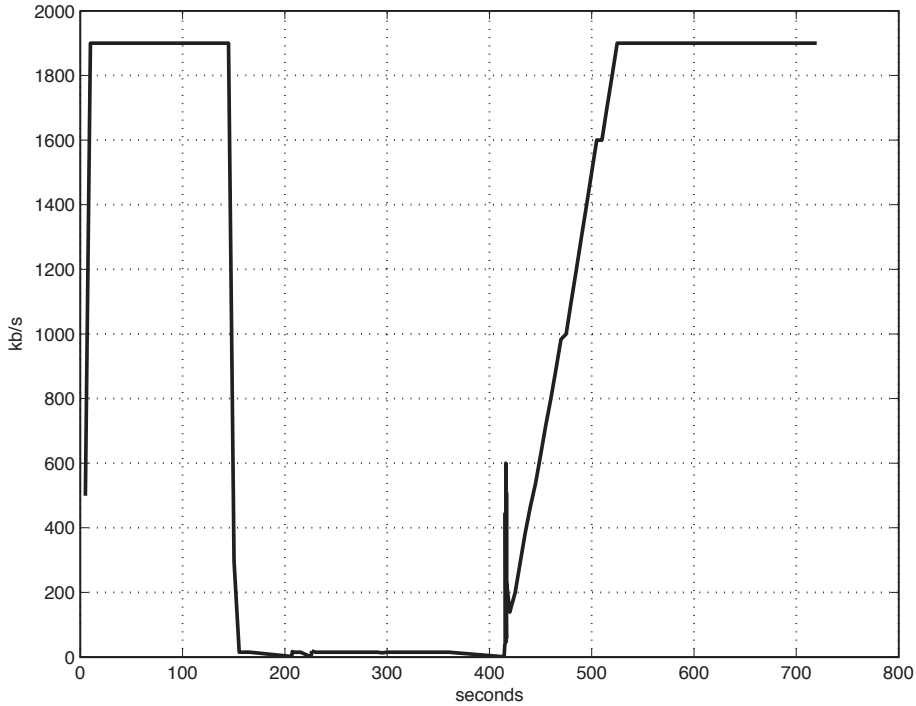

Figure 3: Failover test results (data set #1)

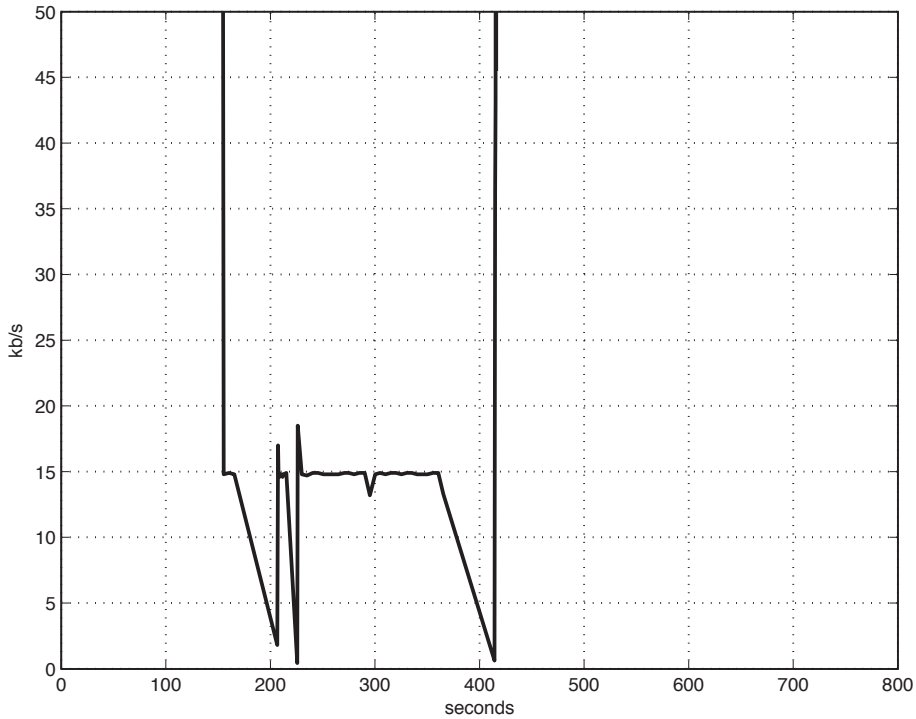

*Figure 4: **Detail** of failover test results (data set #1)*

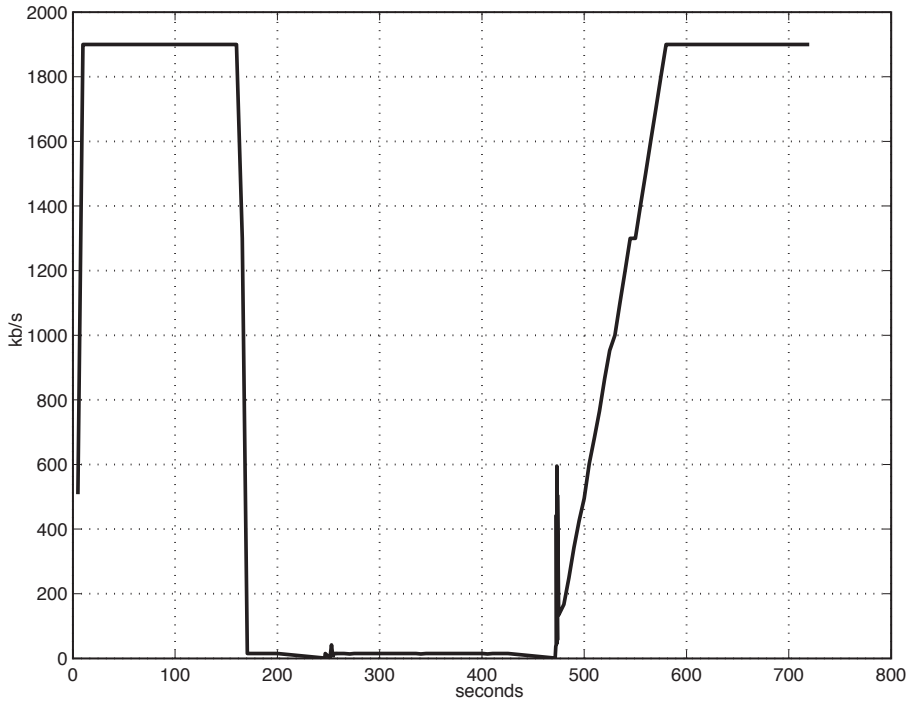

Figure 5: Failover test results (data set #2)

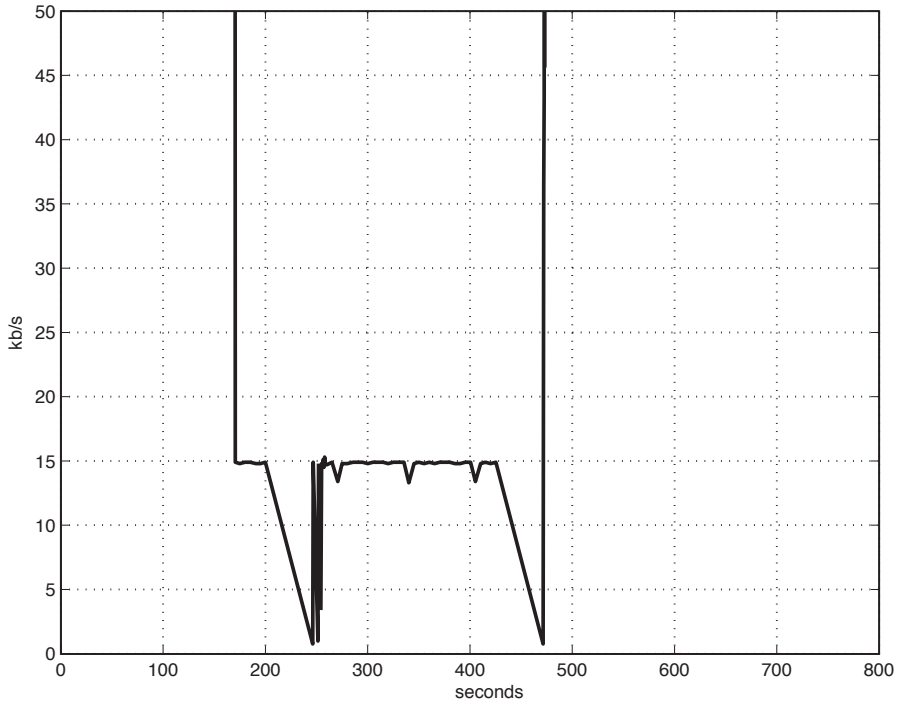

*Figure 6: **Detail** of failover test results (data set #2)*

Conclusions:

These tests demonstrated that TCP sessions between two hosts, one mobile and one fixed, on separate networks, are capable of full utilization of available bandwidth. The available bandwidth is determined by the mobile host's physical connection(s) back to the fixed host.

We demonstrated that we can reliably take multiple physical links and build a wireless network using TCP which is fault tolerant in a mobile environment, and maximizing the available bandwidth.

Using Cisco router priority on the primary and backup links, the TCP application Iperf demonstrated the maximum available link bandwidth was available to TCP applications to transfer data files between the mobile and fixed hosts and that these transfers were performed as quickly as possible.

Problems and Issues:

One expected problem we confirmed was the great decrease in throughput when using highly asymmetrical links. This was the case when we used the Ku satcom for the forward link and the VHF for the return link. This is not completely surprising given that the return VHF channel is capable of less than 1% of the throughput of the forrward Ku Satcom channel. The source of the problem is the low rate of the IP reply acknowledgement packets sent back over the VHF link. There are remedies available to help alleviate this type of problem. Aside from bringing the asymmetrical link speeds closer together, it is possible to tune the TCP stack so it requires fewer acknowledgments for the same payload.

Another issue observed was a lag in switching time between physical links. This problem stems from a lack of a true end-to-end process in place to accurately detect loss of connectivity. The mechanism used to detect loss of a physical link was keep-alive packets. The keep-alive packets were sent every 2 seconds on the VHF system and every 10 seconds on the Ku satcom system. Upon detecting loss of five consecutive keep-alive packets, the router link state would be considered “down”. Due to the limitation of the frequency of the keep-alive packets, a significant link handoff delay was observed.

The only means available to detect loss of communications on all of our links was via keep-alive packets. The router requires five keep-alive packets to be lost before it considers the link down. This approach has its own problems in that the link must carry additional packets and even though payload data may be passing over the link, the keep-alives are still sent, therefore taking additional bandwidth on the already slow data stream.

Appendix A: Theoretical Throughput

TCP/IP Application Theoretical Throughput

An application's theoretical throughput is always equal to or slower than the slowest datapath link speed in the system. This is due to the various encoding overhead incurred on the application data by the various datapath layers This encoding overhead includes IP, TCP, physical link encapsulation and other sources that subtract from the application's throughput.

The TCP/IP application, *iperf*, uses two computers to generate traffic. These computers are connected at 100 Mb/s to the Ethernet switches using 100BASE-TX full duplex. The switches are then connected at 10 Mb/s to the CISCO 3640 routers with 10BASE-TX full duplex. The "fixed side" and "mobile side" routers pass IP data across the RF links using "PPP over HDLC" with a 2.048 Mb/s/ (fixed-to-mobile) and 256 kb/s (mobile-to-fixed) synchronous serial interface for the satcom link and "PPP over HDLC" with an 19.2 kb/s asynchronous serial interface for the VHF link. Since the modems' serial interfaces are the slowest link in the system, those data rates determine a TCP/IP application's "theoretical throughput".

Figure A.1 shows the equipment interconnections.

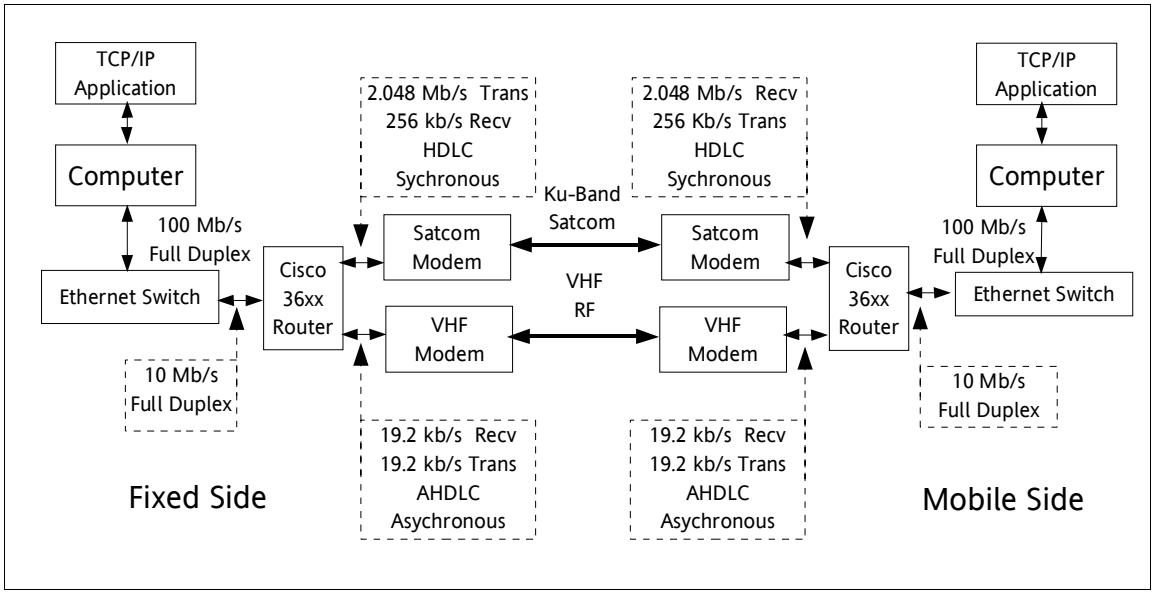

Figure A.1: Equipment interconnections

TCP/IP Application "Theoretical Throughput" Determination

A TCP/IP application's theoretical throughput is determined by the data path overhead and the slowest link in the data path. The overhead is introduced by the different protocols such as Internet Protocol(IP), Transmission Control Protocol (TCP), Point to Point Protocol (PPP), High Level Data Link Control (HDLC), and asynchronous serial communication overhead. The TCP layer receives the user data, adds protocol state overhead, and then sends the data to the IP layer. The IP layer adds addressing and determines whether the resulting TCP/IP message must be fragmented to fit on the physical layer. The amount of physical link data that can be encapsulated into a single packet for transmission is called the "Maximum Transmission Unit" (MTU). Due to the TCP's reliable transport of user data, TCP determines a "maximum segment size" (MSS) based on the physical network's MTU size. For Ethernet, the MTU is 1500 bytes. When the router receives a Ethernet packet, it re-encapsulates the packet as a PPP frame to be synchronously or asynchronously transmitted depending on which datapath (VHF or satcom) is used.

For the VHF case, the application's theoretical throughput is approximately 75.4% of the modem's asynchronous serial interface data rate. For the satcom case, the application's theoretical throughput is approximately 94.2% of the modem's synchronous serial interface data rate. The following calculations show the expected theoretical throughput for a TCP/IP application using the three unique datapaths of "fixed to mobile over satcom", "mobile to fixed over satcom", and "fixed to/from mobile over VHF". The "Expected Theoretical Throughput" calculations were derived using RFC1661, RFC1549, RFC1323, and RFC1332.

Copies of the RFCs are available at <*http://faqs.org*>.

In the case of a hybrid link, (one direction using VHF, and the other using satcom), the lower bandwidth link will limit the throughput rate of the other. The bandwidth will be limited either by the forward transmission rate or the rate at which acknowledgements can be sent.

Expected theoretical throughput:

N_S = % of modem's serial interface rate is user data.
N_{S_sat} = % of satcom modem's serial interface rate is user data.
N_{S_vhf} = % of VHF modem's serial interface rate is user data.
N_{IH} = Fixed IP headersize is 20 bytes.
N_{TH} = Fixed TCP headersize is 20 bytes.
N_{TO} = Variable length TCP options field of 0 to 40 bytes.
SACK turned on: 8*(n+2) bytes where n = SACK block
Timestamp turned on: 12 bytes
N_{MSS} = Largest TCP segment size before IP fragmentation occurs in bytes.
$MTU_{Ethernet}$ = Largest write size supported by the physical link in bytes.
MS_{user} = 8 bits of user data in serial datapath.
$MS_{overhead}$ = Serial path overhead for every MS_{user} in bits.
N_{PPP} = Point to Point Protocol overhead in bytes.

Determine largest N_{MSS} before IP fragmentation with Ethernet MTU and worst N_{TO}:

$$MTU_{Ethernet} \geqslant N_{IH} + N_{TH} + N_{TO} + N_{MSS}$$
$$1500\ bytes \geqslant N_{MSS} + 20\ bytes + 40\ bytes + 20\ bytes$$
$$N_{MSS} \leqslant 1420\ bytes$$

Determine N_{PPP} using RFC1661 {assumes no byte stuffing on PPP serial link},

N_{PPP} is $|flag\ 1\ byte|Address\ 1\ byte|Control\ 1\ byte|PPP\ protocol\ field\ 2\ bytes|$
$|MTU_{ethernet}|padding|FCS\ 2\ bytes|flag\ 1\ byte|$
= 8 bytes + possible stuffing overhead in user data field = 8 bytes

Determine % of modem's serial interface rate is user data,

$$N_S = \frac{N_{MSS}}{N_{PPP} + MTU_{Ethernet}} \cdot \frac{MS_{user}}{MS_{overhead} + MS_{user}}$$

Determine % of satcom modem's serial interface rate is user data (sync serial),

$$N_{S_sat} = \frac{1420\ \text{bytes}}{8\ \text{bytes} + 1500\ \text{bytes}} \cdot \frac{8\ \text{bits}}{8\ \text{bits}} = .9416 = 94.16\ \%$$

Determine % of VHF modem's serial interface rate is user data (async serial),

$$N_{S_vhf} = \frac{1420\ \text{bytes}}{8\ \text{bytes} + 1500\ \text{bytes}} \cdot \frac{8\ \text{bits}}{8\ \text{bits} + 2\ \text{bits}} = .7533 = 75.33\%$$

Expected theoretical throughput for satcom and VHF links

$R_{\text{f-m}}$ = Theoretical throughput over satcom (fixed to mobile).
$R_{\text{m-f}}$ = Theoretical throughput over satcom (mobile to fixed).
R_{VHF} = Theoretical throughput over VHF.
$N_{\text{S_sat}}$ = % of satcom modem's serial interface rate is user data.
$N_{\text{S_vhf}}$ = % of VHF modem's serial interface rate is user data.
$R_{\text{S_satfm}}$ = Satcom modem's serial interface speed in Mb/s (fixed to mobile).
$R_{\text{S_satmf}}$ = Satcom modem's serial interface speed in kb/s (mobile to fixed).
$R_{\text{S_VHF}}$ = VHF modem serial interface speed in kb/s (either direction).

Theoretical throughput over satcom (fixed to mobile).

$$R_{\text{f-m}} = N_{\text{S_sat}} \cdot R_{\text{S_satfm}} = 0.9416 \cdot 2.048 \text{ Mb/s} \approx 1.928 \text{ Mb/s}$$

Theoretical throughput over satcom (mobile to fixed).

$$R_{\text{m-f}} = N_{\text{S_sat}} \cdot R_{\text{S_satmf}} = 0.9416 \cdot 256 \text{ kb/s} \approx 241.0 \text{ kb/s}$$

Theoretical throughput over VHF (either direction).

$$R_{\text{VHF}} = N_{\text{S_vhf}} \cdot R_{\text{S_VHF}} = 0.7533 \cdot 19.2 \text{ kb/s} \approx 14.46 \text{ kb/s}$$

Appendix B: Log Files

The log files are labeled as follows:

<month>_<day>_<site>_<local-uplink>_<remote-uplink>_<test-direction>

month: Three letter abbreviation of the month the test was run.

day: Two numbers denoting the day the test was run.

site: Fixed (fxd), or Mobile (mob)

local-uplink: Satcom (sat), or VHF (vhf)

remote-uplink: Satcom (sat), or VHF (vhf)

test-direction: Data sample of the Receive (rx) or Transmit (tx) side of the local interface.

"*feb_05_fxd_sat_sat_rx*" would imply a test run on February 5th, at the Fixed station, with Fixed station satellite uplink paired with Mobile station satellite downlink, Mobile station satellite uplink paired with Fixed station satellite downlink, and logging data on the receive side of the fixed station.

```
feb_05_fxd_sat_sat_rx

Script started on Wed Feb 05 10:00:06 2003
[51] [aatt-temp2] >./fxd_sat_recv

Fixed station - Satellite Receive

Script started - Wed Feb  5 10:00:20 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 16384 bytes
Number of Packets ------- 2048
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135780 bytes
Connection from --------- 139.88.12.31 (mobile-pc2)
Throughput -------------- 0.23 (Mbits/sec)

Elapsed time: 277.71 seconds    CPU usage:   0%
Received: 5355 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.20.33 port 5001 connected with 139.88.12.31 port 32801
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   105 KBytes   167 Kbits/sec
[  4]  5.0-10.0 sec   152 KBytes   243 Kbits/sec
[  4] 10.0-15.1 sec  44.3 KBytes  69.3 Kbits/sec
[  4] 15.1-20.2 sec  35.7 KBytes  56.5 Kbits/sec
[  4] 20.2-25.3 sec  30.6 KBytes  48.4 Kbits/sec
[  4] 25.3-30.0 sec   164 KBytes   276 Kbits/sec
[  4] 30.0-35.0 sec   152 KBytes   243 Kbits/sec
[  4] 35.0-40.0 sec   152 KBytes   243 Kbits/sec
[  4] 40.0-45.0 sec   152 KBytes   243 Kbits/sec
[  4] 45.0-50.0 sec   152 KBytes   243 Kbits/sec
[  4] 50.0-55.0 sec   152 KBytes   243 Kbits/sec
[  4] 55.0-60.0 sec   152 KBytes   243 Kbits/sec
[  4] 60.0-65.0 sec   152 KBytes   243 Kbits/sec
[  4] 65.0-70.0 sec   152 KBytes   243 Kbits/sec
[  4] 70.0-75.0 sec   152 KBytes   243 Kbits/sec
[  4] 75.0-80.0 sec   152 KBytes   243 Kbits/sec
[  4] 80.0-85.0 sec   152 KBytes   243 Kbits/sec
[  4] 85.0-90.0 sec   152 KBytes   243 Kbits/sec
[  4] 90.0-95.0 sec   152 KBytes   243 Kbits/sec
```

```
[  4] 95.0-100.0 sec   152 KBytes   243 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   152 KBytes   243 Kbits/sec
[  4] 105.0-110.0 sec   152 KBytes   243 Kbits/sec
[  4] 110.0-115.0 sec   152 KBytes   243 Kbits/sec
[  4] 115.0-120.0 sec   152 KBytes   243 Kbits/sec
[  4] 120.0-125.0 sec   152 KBytes   243 Kbits/sec
[  4] 125.0-130.0 sec   152 KBytes   243 Kbits/sec
[  4] 130.0-135.0 sec   152 KBytes   243 Kbits/sec
[  4] 135.0-140.0 sec   152 KBytes   243 Kbits/sec
[  4] 140.0-145.0 sec   152 KBytes   243 Kbits/sec
[  4] 145.0-150.0 sec   152 KBytes   243 Kbits/sec
[  4] 150.0-155.0 sec   152 KBytes   243 Kbits/sec
[  4] 155.0-160.0 sec   152 KBytes   243 Kbits/sec
[  4] 160.0-165.0 sec   152 KBytes   243 Kbits/sec
[  4] 165.0-172.2 sec   124 KBytes   138 Kbits/sec
[  4] 172.2-175.0 sec   180 KBytes   511 Kbits/sec
[  4] 175.0-180.0 sec   152 KBytes   243 Kbits/sec
[  4] 180.0-185.0 sec   152 KBytes   243 Kbits/sec
[  4] 185.0-190.0 sec   152 KBytes   243 Kbits/sec
[  4] 190.0-195.0 sec   152 KBytes   243 Kbits/sec
[  4] 195.0-200.0 sec   152 KBytes   243 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.0-205.0 sec   152 KBytes   243 Kbits/sec
[  4] 205.0-210.0 sec   152 KBytes   243 Kbits/sec
[  4] 210.0-215.0 sec   152 KBytes   243 Kbits/sec
[  4] 215.0-220.0 sec   152 KBytes   243 Kbits/sec
[  4] 220.0-225.0 sec   152 KBytes   243 Kbits/sec
[  4] 225.0-230.0 sec   152 KBytes   243 Kbits/sec
[  4] 230.0-235.0 sec   152 KBytes   243 Kbits/sec
[  4] 235.0-240.0 sec   152 KBytes   243 Kbits/sec
[  4]  0.0-244.1 sec   6.9 MBytes   231 Kbits/sec
^C
Script ended - Wed Feb  5 10:10:39 EST 2003

[52] [aatt-temp2] >exit

script done on Wed Feb 05 10:10:42 2003
```

```
feb_05_fxd_sat_sat_tx

Script started on Wed Feb 05 09:52:59 2003
[51] [aatt-temp2] >./fxd_sat_send mobile-pc2

Fixed station - Satellite Transmit

Script started - Wed Feb  5 09:53:14 EST 2003


Starting Pings

PING mobile-pc2: 56 data bytes
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=515. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=515. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 515/515/515
PING mobile-pc2: 504 data bytes
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=533. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=532. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=532. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 532/532/533
PING mobile-pc2: 1016 data bytes
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=553. ms
```

```
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=553. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=553. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 553/553/553
PING mobile-pc2: 1392 data bytes
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=568. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=568. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 568/568/568
PING mobile-pc2: 1442 data bytes
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=570. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=570. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 570/570/570
PING mobile-pc2: 2040 data bytes
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=593. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=593. ms
```

```
----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 593/593/593
PING mobile-pc2: 4088 data bytes
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=670. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=669. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=669. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 669/669/670

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 16384 bytes
Number of Packets ------- 500
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135000 bytes
Connection made to ------ 139.88.12.31 (mobile-pc2)
Throughput ............   1.78 (Mbits/sec)

Elapsed time: 35.94 seconds    CPU usage:   0%
Xmit: 13.91 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to mobile-pc2, TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.20.33 port 32802 connected with 139.88.12.31 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.3 sec   408 KBytes   614 Kbits/sec
[  4]  5.3-10.2 sec   1.2 MBytes   1.9 Mbits/sec
```

```
[  4] 10.2-15.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.1-20.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 20.5-25.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.4-30.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.3-35.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.2-40.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.1-45.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 45.5-50.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.4-55.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.3-60.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.1-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 70.5-75.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.3-80.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.2-85.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.1-90.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 90.5-95.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 95.4-100.3 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.3-105.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 105.2-110.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 110.0-115.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 115.5-120.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 120.4-125.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 125.3-130.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 130.1-135.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 135.0-140.4 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 140.4-145.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 145.3-150.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 150.2-155.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 155.1-160.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 160.5-165.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 165.4-170.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 170.3-175.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 175.2-180.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 180.0-185.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 185.5-190.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 190.3-195.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 195.2-200.1 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.1-205.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 205.5-210.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 210.4-215.3 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 215.3-220.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 220.2-225.1 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 225.1-230.5 sec   1.3 MBytes   1.9 Mbits/sec
[  4] 230.5-235.4 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 235.4-240.2 sec   1.2 MBytes   1.9 Mbits/sec
[  4]  0.0-240.8 sec  56.8 MBytes   1.9 Mbits/sec
```

```
Script ended - Wed Feb  5 09:59:14 EST 2003
[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 09:59:43 2003
```

```
feb_05_fxd_sat_vhf_rx

Script started on Wed Feb 05 10:22:29 2003
[51] [aatt-temp2] >./fxd_vhf_recv

Fixed station - VHF Receive

Script started - Wed Feb  5 10:22:44 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 8192 bytes
Number of Packets ------- 2048
REAL Buffer Size -------- 8760 bytes
Connection from --------- 139.88.12.31 (mobile-pc2)
Throughput -------------- 0.01 (Mbits/sec)

Elapsed time: 228.45 seconds    CPU usage:   0%
Received: 300 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.20.33 port 5001 connected with 139.88.12.31 port 32804
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.2 sec   9.4 KBytes  14.6 Kbits/sec
[  4]  5.2-10.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 10.3-15.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 15.5-20.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 20.6-25.8 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 25.8-30.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 30.2-35.8 sec  10.3 KBytes  14.6 Kbits/sec
[  4] 35.8-40.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 40.2-45.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 45.3-50.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 50.5-55.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 55.6-60.8 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 60.8-65.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 65.1-70.7 sec  10.3 KBytes  14.6 Kbits/sec
[  4] 70.7-75.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 75.1-80.3 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 80.3-85.4 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 85.4-90.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 90.6-95.7 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 95.7-100.1 sec   8.0 KBytes  14.7 Kbits/sec
```

```
[ ID] Interval       Transfer     Bandwidth
[  4] 100.1-105.7 sec  10.3 KBytes  14.6 Kbits/sec
[  4] 105.7-110.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 110.1-115.2 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 115.2-120.4 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 120.4-125.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 125.5-130.7 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 130.7-135.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 135.0-140.7 sec  10.3 KBytes  14.6 Kbits/sec
[  4] 140.7-145.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 145.0-150.2 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 150.2-155.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 155.3-160.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 160.5-165.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 165.6-170.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 170.0-175.6 sec  10.3 KBytes  14.7 Kbits/sec
[  4] 175.6-180.8 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 180.8-185.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 185.1-190.3 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 190.3-195.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 195.5-200.6 sec   9.4 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.6-205.4 sec   8.9 KBytes  14.7 Kbits/sec
[  4] 205.4-210.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 210.6-215.8 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 215.8-220.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 220.1-225.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 225.3-230.4 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 230.4-235.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 235.6-240.4 sec   8.9 KBytes  14.7 Kbits/sec
[  4] 240.4-245.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4]  0.0-249.2 sec   456 KBytes  14.6 Kbits/sec
^C
Script ended - Wed Feb  5 10:32:52 EST 2003

[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 10:32:55 2003
```

```
feb_05_fxd_sat_vhf_tx

Script started on Wed Feb 05 10:14:42 2003
[51] [aatt-temp2] >./fxd_sat_send mobile-pc2

Fixed station - Satellite Transmit

Script started - Wed Feb  5 10:14:56 EST 2003


Starting Pings

PING mobile-pc2: 56 data bytes
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=324. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=324. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=323. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=323. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 323/323/324
PING mobile-pc2: 504 data bytes
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=564. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=600. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=564. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=599. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=564. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=601. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=564. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=600. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=564. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=599. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 564/581/601
PING mobile-pc2: 1016 data bytes
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=840. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=839. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=839. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=839. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=840. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=840. ms
```

```
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=840. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=840. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=839. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=839. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 839/839/840
PING mobile-pc2: 1392 data bytes
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1042. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1041. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1042. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1041/1041/1042
PING mobile-pc2: 1442 data bytes
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1070. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1069. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1070. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1069. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1069/1069/1070
PING mobile-pc2: 2040 data bytes
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1417. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1551. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1685. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1813. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1956. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=2073. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=2212. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=2341. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=2469. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=2597. ms
```

```
----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1417/2011/2597
PING mobile-pc2: 4088 data bytes
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=2546. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=3791. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=5035. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=6280. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=7518. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=8757. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=10077. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=11488. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 8 packets received, 20% packet loss
round-trip (ms)  min/avg/max = 2546/6936/11488

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 16384 bytes
Number of Packets ------- 500
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135000 bytes
Connection made to ------ 139.88.12.31 (mobile-pc2)
Throughput ............   0.94 (Mbits/sec)

Elapsed time: 68.07 seconds    CPU usage:   0%
Xmit: 7.35 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to mobile-pc2, TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.20.33 port 32804 connected with 139.88.12.31 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.2 sec   808 KBytes   1.2 Mbits/sec
[  4]  5.2-10.6 sec   936 KBytes   1.4 Mbits/sec
[  4] 10.6-15.1 sec   664 KBytes   1.2 Mbits/sec
[  4] 15.1-20.2 sec   800 KBytes   1.2 Mbits/sec
```

```
[  4] 20.2-25.4 sec   800 KBytes   1.2 Mbits/sec
[  4] 25.4-30.6 sec   800 KBytes   1.2 Mbits/sec
[  4] 30.6-35.7 sec   800 KBytes   1.2 Mbits/sec
[  4] 35.7-40.8 sec   800 KBytes   1.2 Mbits/sec
[  4] 40.8-45.1 sec   664 KBytes   1.2 Mbits/sec
[  4] 45.1-50.5 sec   936 KBytes   1.3 Mbits/sec
[  4] 50.5-55.7 sec   800 KBytes   1.2 Mbits/sec
[  4] 55.7-60.1 sec   664 KBytes   1.2 Mbits/sec
[  4] 60.1-65.4 sec   800 KBytes   1.2 Mbits/sec
[  4] 65.4-70.5 sec   800 KBytes   1.2 Mbits/sec
[  4] 70.5-75.7 sec   800 KBytes   1.2 Mbits/sec
[  4] 75.7-80.7 sec   800 KBytes   1.3 Mbits/sec
[  4] 80.7-85.7 sec   800 KBytes   1.2 Mbits/sec
[  4] 85.7-90.8 sec   800 KBytes   1.2 Mbits/sec
[  4] 90.8-95.7 sec   800 KBytes   1.3 Mbits/sec
[  4] 95.7-100.5 sec   800 KBytes   1.3 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.5-105.2 sec   800 KBytes   1.3 Mbits/sec
[  4] 105.2-110.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 110.3-115.3 sec   800 KBytes   1.3 Mbits/sec
[  4] 115.3-120.2 sec   800 KBytes   1.3 Mbits/sec
[  4] 120.2-125.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 125.3-130.5 sec   800 KBytes   1.2 Mbits/sec
[  4] 130.5-135.7 sec   800 KBytes   1.2 Mbits/sec
[  4] 135.7-140.0 sec   672 KBytes   1.2 Mbits/sec
[  4] 140.0-145.1 sec   800 KBytes   1.2 Mbits/sec
[  4] 145.1-150.1 sec   800 KBytes   1.3 Mbits/sec
[  4] 150.1-155.1 sec   800 KBytes   1.2 Mbits/sec
[  4] 155.1-160.1 sec   800 KBytes   1.2 Mbits/sec
[  4] 160.1-165.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 165.3-170.2 sec   800 KBytes   1.3 Mbits/sec
[  4] 170.2-175.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 175.3-180.4 sec   800 KBytes   1.2 Mbits/sec
[  4] 180.4-185.2 sec   800 KBytes   1.3 Mbits/sec
[  4] 185.2-190.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 190.3-195.3 sec   800 KBytes   1.2 Mbits/sec
[  4] 195.3-200.7 sec   800 KBytes   1.2 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.7-205.2 sec   664 KBytes   1.2 Mbits/sec
[  4] 205.2-210.5 sec   800 KBytes   1.2 Mbits/sec
[  4] 210.5-215.4 sec   800 KBytes   1.3 Mbits/sec
[  4] 215.4-220.5 sec   800 KBytes   1.2 Mbits/sec
[  4] 220.5-225.3 sec   800 KBytes   1.3 Mbits/sec
[  4] 225.3-230.6 sec   800 KBytes   1.2 Mbits/sec
[  4] 230.6-235.8 sec   800 KBytes   1.2 Mbits/sec
[  4] 235.8-240.2 sec   664 KBytes   1.2 Mbits/sec
[  4]  0.0-241.0 sec  37.0 MBytes   1.2 Mbits/sec

Script ended - Wed Feb  5 10:21:41 EST 2003
[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 10:21:43 2003
```

```
feb_05_fxd_vhf_sat_rx

Script started on Wed Feb 05 10:54:33 2003
[51] [aatt-temp2] >./fxd_sat_recv

Fixed station - Satellite Receive

Script started - Wed Feb  5 10:54:38 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 16384 bytes
Number of Packets ------- 2048
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135780 bytes
Connection from --------- 139.88.12.31 (mobile-pc2)
Throughput -------------- 0.23 (Mbits/sec)

Elapsed time: 275.01 seconds    CPU usage:   0%
Received: 5353 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.20.33 port 5001 connected with 139.88.12.31 port 32808
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   134 KBytes   212 Kbits/sec
[  4]  5.0-12.8 sec   143 KBytes   147 Kbits/sec
[  4] 12.8-15.1 sec  26.9 KBytes  93.3 Kbits/sec
[  4] 15.1-20.1 sec  56.9 KBytes  91.7 Kbits/sec
[  4] 20.1-25.0 sec   179 KBytes   288 Kbits/sec
[  4] 25.0-30.0 sec   152 KBytes   243 Kbits/sec
[  4] 30.0-35.0 sec   152 KBytes   243 Kbits/sec
[  4] 35.0-40.0 sec   152 KBytes   243 Kbits/sec
[  4] 40.0-45.0 sec   152 KBytes   243 Kbits/sec
[  4] 45.0-50.0 sec   152 KBytes   243 Kbits/sec
[  4] 50.0-55.0 sec   152 KBytes   243 Kbits/sec
[  4] 55.0-60.0 sec   152 KBytes   243 Kbits/sec
[  4] 60.0-65.0 sec   152 KBytes   243 Kbits/sec
[  4] 65.0-70.0 sec   152 KBytes   243 Kbits/sec
[  4] 70.0-75.0 sec   151 KBytes   243 Kbits/sec
[  4] 75.0-80.0 sec   152 KBytes   243 Kbits/sec
[  4] 80.0-85.0 sec   152 KBytes   243 Kbits/sec
[  4] 85.0-90.0 sec   152 KBytes   243 Kbits/sec
[  4] 90.0-95.0 sec   152 KBytes   243 Kbits/sec
```

```
[  4] 95.0-100.0 sec   152 KBytes   243 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   152 KBytes   243 Kbits/sec
[  4] 105.0-110.0 sec   152 KBytes   243 Kbits/sec
[  4] 110.0-115.0 sec   152 KBytes   243 Kbits/sec
[  4] 115.0-120.0 sec   152 KBytes   243 Kbits/sec
[  4] 120.0-125.0 sec   152 KBytes   243 Kbits/sec
[  4] 125.0-130.0 sec   152 KBytes   243 Kbits/sec
[  4] 130.0-136.1 sec  96.0 KBytes   127 Kbits/sec
[  4] 136.1-140.0 sec   208 KBytes   419 Kbits/sec
[  4] 140.0-145.0 sec   152 KBytes   243 Kbits/sec
[  4] 145.0-150.1 sec   152 KBytes   243 Kbits/sec
[  4] 150.1-155.1 sec   152 KBytes   243 Kbits/sec
[  4] 155.1-160.1 sec   152 KBytes   243 Kbits/sec
[  4] 160.1-165.1 sec   152 KBytes   243 Kbits/sec
[  4] 165.1-170.0 sec   151 KBytes   244 Kbits/sec
[  4] 170.0-175.0 sec   152 KBytes   243 Kbits/sec
[  4] 175.0-180.0 sec   152 KBytes   243 Kbits/sec
[  4] 180.0-185.0 sec   151 KBytes   242 Kbits/sec
[  4] 185.0-190.0 sec   152 KBytes   243 Kbits/sec
[  4] 190.0-195.0 sec   152 KBytes   243 Kbits/sec
[  4] 195.0-200.0 sec   152 KBytes   243 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.0-205.0 sec   152 KBytes   243 Kbits/sec
[  4] 205.0-210.0 sec   152 KBytes   243 Kbits/sec
[  4] 210.0-215.0 sec   152 KBytes   243 Kbits/sec
[  4] 215.0-220.0 sec   152 KBytes   243 Kbits/sec
[  4] 220.0-225.0 sec   152 KBytes   243 Kbits/sec
[  4] 225.0-230.0 sec   152 KBytes   243 Kbits/sec
[  4] 230.0-235.0 sec   152 KBytes   243 Kbits/sec
[  4] 235.0-240.0 sec   152 KBytes   243 Kbits/sec
[  4]  0.0-243.5 sec   7.0 MBytes   236 Kbits/sec
^C
Script ended - Wed Feb  5 11:05:23 EST 2003

[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 11:05:24 2003
```

```
feb_05_fxd_vhf_sat_tx

[52] [aatt-temp2] >./fxd_sat_send mobile-pc2

Fixed station - VHF Transmit

Script started - Wed Feb  5 10:44:40 EST 2003


Starting Pings

PING mobile-pc2: 56 data bytes
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=378. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=343. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=322. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=342. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=322. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=343. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=322. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=342. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=322. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=342. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 322/337/378
PING mobile-pc2: 504 data bytes
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=741. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=580. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=575. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=575. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 575/592/741
PING mobile-pc2: 1016 data bytes
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1037. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=931. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=871. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=865. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=931. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=864. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=931. ms
```

```
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=862. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=932. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=865. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 862/908/1037
PING mobile-pc2: 1392 data bytes
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1253. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1079. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1079. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1078. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1078. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1078/1095/1253
PING mobile-pc2: 1442 data bytes
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1287. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1205. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1108. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1107. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1108. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1107. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1107. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1107. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1107. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1107. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1107/1135/1287
PING mobile-pc2: 2040 data bytes
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1625. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1810. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1982. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=2169. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=2332. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=2514. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=2687. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=2859. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=3040. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=3203. ms
```

```
----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1625/2422/3203
PING mobile-pc2: 4088 data bytes
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=2904. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=4306. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=5599. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=6893. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=8179. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=9460. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=10824. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=12226. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 8 packets received, 20% packet loss
round-trip (ms)  min/avg/max = 2904/7548/12226

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 8192 bytes
Number of Packets ------- 50
REAL Buffer Size -------- 8192 bytes
Connection made to ------ 139.88.12.31 (mobile-pc2)
Throughput ............   0.01 (Mbits/sec)

Elapsed time: 218.10 seconds    CPU usage:   0%
Xmit: 0.23 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to mobile-pc2, TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.20.33 port 32809 connected with 139.88.12.31 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.7 sec  24.0 KBytes  33.6 Kbits/sec
[  4]  5.7-10.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 10.1-18.9 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 18.9-23.3 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 23.3-27.7 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 27.7-32.1 sec   8.0 KBytes  14.5 Kbits/sec
```

```
[  4] 32.1-36.6 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 36.6-41.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 41.0-45.4 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 45.4-54.2 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 54.2-58.6 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 58.6-63.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 63.0-67.4 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 67.4-71.8 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 71.8-76.2 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 76.2-80.6 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 80.6-85.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 85.0-93.8 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 93.8-98.2 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 98.2-102.6 sec   8.0 KBytes  14.5 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 102.6-107.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 107.0-111.5 sec   8.0 KBytes  14.4 Kbits/sec
[  4] 111.5-115.9 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 115.9-120.3 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 120.3-129.1 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 129.1-133.5 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 133.5-137.9 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 137.9-142.3 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 142.3-146.7 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 146.7-151.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 151.1-155.5 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 155.5-164.3 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 164.3-168.7 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 168.7-173.1 sec   8.0 KBytes  14.4 Kbits/sec
[  4] 173.1-177.5 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 177.5-181.9 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 181.9-186.3 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 186.3-190.7 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 190.7-195.2 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 195.2-203.9 sec  16.0 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 203.9-208.3 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 208.3-212.8 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 212.8-217.2 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 217.2-221.6 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 221.6-226.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 226.0-230.4 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 230.4-239.2 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 239.2-243.6 sec   8.0 KBytes  14.5 Kbits/sec
[  4]  0.0-251.5 sec   456 KBytes  14.5 Kbits/sec

Script ended - Wed Feb  5 10:54:07 EST 2003
[53] [aatt-temp2] >exit
exit

script done on Wed Feb 05 10:54:22 2003
```

```
feb_05_fxd_vhf_vhf_rx

Script started on Wed Feb 05 11:17:49 2003
[51] [aatt-temp2] >./fxd_vhf_recv

Fixed station - VHF Receive

Script started - Wed Feb  5 11:17:57 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 8192 bytes
Number of Packets ------- 2048
REAL Buffer Size -------- 8760 bytes
Connection from --------- 139.88.12.31 (mobile-pc2)
Throughput -------------- 0.01 (Mbits/sec)

Elapsed time: 221.41 seconds    CPU usage:   0%
Received: 300 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.20.33 port 5001 connected with 139.88.12.31 port 32811
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.1 sec   9.4 KBytes  14.7 Kbits/sec
[  4]  5.1-10.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 10.2-15.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 15.3-20.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 20.4-25.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 25.5-30.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 30.2-35.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 35.3-40.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 40.4-45.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 45.5-50.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 50.6-55.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 55.7-60.4 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 60.4-65.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 65.6-70.6 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 70.6-75.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 75.7-80.0 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 80.0-85.1 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 85.1-90.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 90.2-95.7 sec  10.3 KBytes  14.8 Kbits/sec
[  4] 95.7-100.1 sec   8.0 KBytes  14.8 Kbits/sec
```

```
[ ID] Interval       Transfer     Bandwidth
[  4] 100.1-105.1 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 105.1-110.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 110.3-115.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 115.3-120.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 120.4-125.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 125.2-130.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 130.3-135.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 135.4-140.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 140.5-145.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 145.5-150.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 150.6-155.4 sec   8.9 KBytes  14.8 Kbits/sec
[  4] 155.4-160.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 160.5-165.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 165.6-170.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 170.7-175.8 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 175.8-180.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 180.1-185.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 185.2-190.7 sec  10.3 KBytes  14.8 Kbits/sec
[  4] 190.7-195.0 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 195.0-200.1 sec   9.4 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.1-205.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 205.2-210.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 210.3-215.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 215.4-220.2 sec   8.9 KBytes  14.8 Kbits/sec
[  4] 220.2-225.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 225.3-230.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 230.3-235.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 235.4-240.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 240.5-245.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 245.6-250.4 sec   8.9 KBytes  14.8 Kbits/sec
[  4]  0.0-250.4 sec   464 KBytes  14.8 Kbits/sec
exit
^C
Script ended - Wed Feb  5 11:27:39 EST 2003

[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 11:27:40 2003
```

```
feb_05_fxd_vhf_vhf_tx

Script started on Wed Feb 05 11:07:57 2003
[51] [aatt-temp2] >./fxd_vhf_send mobile-pc2

Fixed station - VHF Transmit

Script started - Wed Feb  5 11:08:13 EST 2003


Starting Pings

PING mobile-pc2: 56 data bytes
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=183. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=132. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=131. ms
64 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=131. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 131/136/183
PING mobile-pc2: 504 data bytes
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=764. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=606. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=607. ms
512 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=657. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 606/627/764
PING mobile-pc2: 1016 data bytes
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1307. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1152. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1169. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1151. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1152. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1151. ms
```

```
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1151. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1153. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1151. ms
1024 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1151. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1151/1168/1307
PING mobile-pc2: 1392 data bytes
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1709. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1551. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1552. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1553. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1552. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1553. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1553. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1553. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1553. ms
1400 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1553. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1551/1568/1709
PING mobile-pc2: 1442 data bytes
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=1764. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=1607. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=1606. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=1607. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=1606. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=1607. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=1606. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=1607. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=1607. ms
1450 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=1605. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1605/1622/1764
PING mobile-pc2: 2040 data bytes
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=2422. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=2536. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=2698. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=2861. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=3022. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=3183. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=3345. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=3506. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=8. time=3667. ms
2048 bytes from mobile-pc2 (139.88.12.31): icmp_seq=9. time=3849. ms
```

```
----mobile-pc2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 2422/3108/3849
PING mobile-pc2: 4088 data bytes
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=0. time=4963. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=1. time=6180. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=2. time=7396. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=3. time=8615. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=4. time=9863. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=5. time=11124. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=6. time=12385. ms
4096 bytes from mobile-pc2 (139.88.12.31): icmp_seq=7. time=13650. ms

----mobile-pc2 PING Statistics----
10 packets transmitted, 8 packets received, 20% packet loss
round-trip (ms)  min/avg/max = 4963/9272/13650

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 8192 bytes
Number of Packets ------- 50
REAL Buffer Size -------- 8192 bytes
Connection made to ------ 139.88.12.31 (mobile-pc2)
Throughput ............   0.01 (Mbits/sec)

Elapsed time: 213.97 seconds    CPU usage:   0%
Xmit: 0.23 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to mobile-pc2, TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.20.33 port 32811 connected with 139.88.12.31 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.4 sec  24.0 KBytes  35.4 Kbits/sec
[  4]  5.4-14.1 sec  16.0 KBytes  14.7 Kbits/sec
[  4] 14.1-18.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 18.4-22.8 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 22.8-27.2 sec   8.0 KBytes  14.7 Kbits/sec
```

```
[  4] 27.2-31.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 31.5-35.9 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 35.9-40.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 40.2-48.9 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 48.9-53.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 53.2-57.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 57.6-61.9 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 61.9-66.3 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 66.3-70.6 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 70.6-79.3 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 79.3-83.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 83.6-88.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 88.0-92.4 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 92.4-96.7 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 96.7-101.1 sec   8.0 KBytes  14.7 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 101.1-105.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 105.4-114.1 sec  16.0 KBytes  14.7 Kbits/sec
[  4] 114.1-118.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 118.5-122.8 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 122.8-127.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 127.2-131.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 131.5-135.9 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 135.9-140.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 140.2-148.9 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 148.9-153.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 153.2-157.6 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 157.6-162.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 162.0-166.3 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 166.3-170.7 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 170.7-175.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 175.0-183.7 sec  16.0 KBytes  14.7 Kbits/sec
[  4] 183.7-188.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 188.0-192.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 192.4-196.7 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 196.7-201.1 sec   8.0 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 201.1-205.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 205.4-214.1 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 214.1-218.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 218.5-222.8 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 222.8-227.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 227.2-231.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 231.5-235.9 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 235.9-240.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4]  0.0-248.1 sec   456 KBytes  14.7 Kbits/sec

Script ended - Wed Feb  5 11:17:36 EST 2003
[52] [aatt-temp2] >exit
exit

script done on Wed Feb 05 11:17:43 2003
```

```
feb_05_mob_sat_sat_rx

Script started on Wed Feb 05 09:53:33 2003
[51] [mobile-gw] >./mob_sat_recv

Mobile station - Satellite Receive

Script started - Wed Feb  5 09:53:41 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 16384 bytes
Number of Packets ------- 2048
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135780 bytes
Connection from --------- 139.88.20.33 (aatt-temp2)
Throughput -------------- 1.77 (Mbits/sec)

Elapsed time: 36.25 seconds    CPU usage:   0%
Received: 3008 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32802
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   318 KBytes   508 Kbits/sec
[  4]  5.0-10.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 10.0-15.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.0-20.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 20.0-25.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.0-30.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.0-35.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.0-40.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.0-45.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 45.0-50.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.0-55.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.0-60.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.0-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 70.0-75.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.0-80.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.0-85.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.0-90.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 90.0-95.0 sec   1.2 MBytes   1.9 Mbits/sec
```

```
[  4] 95.0-100.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 105.0-110.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 110.0-115.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 115.0-120.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 120.0-125.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 125.0-130.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 130.0-135.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 135.0-140.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 140.0-145.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 145.0-150.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 150.0-155.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 155.0-160.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 160.0-165.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 165.0-170.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 170.0-175.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 175.0-180.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 180.0-185.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 185.0-190.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 190.0-195.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 195.0-200.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.0-205.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 205.0-210.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 210.0-215.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 215.0-220.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 220.0-225.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 225.0-230.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 230.0-235.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 235.0-240.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4]  0.0-240.3 sec  56.8 MBytes   1.9 Mbits/sec
^C
Script ended - Wed Feb  5 09:59:19 EST 2003

[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 09:59:30 2003
```

```
feb_05_mob_sat_sat_tx

Script started on Wed Feb 05 09:59:38 2003
[51] [mobile-gw] >./mob_sat_send aatt-temp2

Mobile station - Satellite Transmit

Script started - Wed Feb  5 10:00:33 EST 2003


Starting Pings

PING aatt-temp2: 56 data bytes
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=515. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=515. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 515/515/515
PING aatt-temp2: 504 data bytes
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=532. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=532. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 532/532/532
PING aatt-temp2: 1016 data bytes
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=553. ms
```

```
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=553. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=553. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 553/553/553
PING aatt-temp2: 1392 data bytes
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=568. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=568. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 568/568/568
PING aatt-temp2: 1442 data bytes
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=570. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=570. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 570/570/570
PING aatt-temp2: 2040 data bytes
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=592. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=592. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=593. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=592. ms
```

```
----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 592/592/593
PING aatt-temp2: 4088 data bytes
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=669. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=669. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 669/669/669

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 16384 bytes
Number of Packets ------- 500
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135000 bytes
Connection made to ------ 139.88.20.33 (aatt-temp2)
Throughput ............   0.23 (Mbits/sec)

Elapsed time: 273.81 seconds    CPU usage:   0%
Xmit: 1.83 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to aatt-temp2, TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 32801 connected with 139.88.20.33 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 7.8 sec   272 KBytes   277 Kbits/sec
[  4]  7.8-11.1 sec   136 KBytes   333 Kbits/sec
```

```
[  4] 11.1-28.5 sec   136 KBytes  62.5 Kbits/sec
[  4] 28.5-28.5 sec   8.0 KBytes   256 Mbits/sec
[  4] 28.5-28.5 sec   8.0 KBytes   398 Mbits/sec
[  4] 28.5-32.8 sec   112 KBytes   207 Kbits/sec
[  4] 32.8-37.1 sec   136 KBytes   255 Kbits/sec
[  4] 37.1-41.4 sec   128 KBytes   238 Kbits/sec
[  4] 41.4-45.7 sec   136 KBytes   252 Kbits/sec
[  4] 45.7-50.0 sec   128 KBytes   240 Kbits/sec
[  4] 50.0-58.6 sec   264 KBytes   245 Kbits/sec
[  4] 58.6-63.0 sec   136 KBytes   249 Kbits/sec
[  4] 63.0-67.3 sec   136 KBytes   252 Kbits/sec
[  4] 67.3-71.7 sec   128 KBytes   235 Kbits/sec
[  4] 71.7-76.0 sec   136 KBytes   252 Kbits/sec
[  4] 76.0-80.3 sec   128 KBytes   240 Kbits/sec
[  4] 80.3-89.0 sec   272 KBytes   251 Kbits/sec
[  4] 89.0-93.3 sec   128 KBytes   238 Kbits/sec
[  4] 93.3-97.6 sec   136 KBytes   248 Kbits/sec
[  4] 97.6-101.9 sec   136 KBytes   253 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 101.9-106.3 sec   128 KBytes   234 Kbits/sec
[  4] 106.3-110.7 sec   136 KBytes   247 Kbits/sec
[  4] 110.7-115.0 sec   136 KBytes   255 Kbits/sec
[  4] 115.0-123.7 sec   264 KBytes   243 Kbits/sec
[  4] 123.7-128.0 sec   128 KBytes   238 Kbits/sec
[  4] 128.0-132.4 sec   136 KBytes   248 Kbits/sec
[  4] 132.4-136.7 sec   136 KBytes   253 Kbits/sec
[  4] 136.7-141.1 sec   128 KBytes   234 Kbits/sec
[  4] 141.1-145.4 sec   136 KBytes   253 Kbits/sec
[  4] 145.4-154.0 sec   264 KBytes   246 Kbits/sec
[  4] 154.0-158.3 sec   128 KBytes   238 Kbits/sec
[  4] 158.3-162.6 sec   136 KBytes   248 Kbits/sec
[  4] 162.6-167.0 sec   136 KBytes   253 Kbits/sec
[  4] 167.0-173.1 sec   128 KBytes   166 Kbits/sec
[  4] 173.1-177.4 sec   136 KBytes   255 Kbits/sec
[  4] 177.4-181.7 sec   128 KBytes   238 Kbits/sec
[  4] 181.7-186.0 sec   136 KBytes   252 Kbits/sec
[  4] 186.0-190.3 sec   128 KBytes   240 Kbits/sec
[  4] 190.3-199.0 sec   272 KBytes   251 Kbits/sec
[  4] 199.0-203.3 sec   136 KBytes   253 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 203.3-207.7 sec   128 KBytes   234 Kbits/sec
[  4] 207.7-212.0 sec   136 KBytes   253 Kbits/sec
[  4] 212.0-216.3 sec   128 KBytes   237 Kbits/sec
[  4] 216.3-220.5 sec   136 KBytes   255 Kbits/sec
[  4] 220.5-229.2 sec   264 KBytes   245 Kbits/sec
[  4] 229.2-233.4 sec   128 KBytes   240 Kbits/sec
[  4] 233.4-237.7 sec   136 KBytes   253 Kbits/sec
[  4] 237.7-242.1 sec   128 KBytes   237 Kbits/sec
[  4]  0.0-244.6 sec   6.9 MBytes   230 Kbits/sec
```

```
Script ended - Wed Feb  5 10:10:35 EST 2003
[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 10:10:44 2003
```

```
feb_05_mob_sat_vhf_rx

[55] [mobile-gw] >./mot_sat_recv

Mobile station - VHF Receive

Script started - Wed Feb  5 10:44:35 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 8192 bytes
Number of Packets ------- 2048
REAL Buffer Size -------- 8760 bytes
Connection from --------- 139.88.20.33 (aatt-temp2)
Throughput -------------- 0.01 (Mbits/sec)

Elapsed time: 225.40 seconds    CPU usage:   0%
Received: 300 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32809
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.3 sec   9.4 KBytes  14.2 Kbits/sec
[  4]  5.3-10.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 10.5-15.7 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 15.7-20.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 20.1-25.3 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 25.3-30.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 30.5-35.4 sec   8.9 KBytes  14.6 Kbits/sec
[  4] 35.4-40.6 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 40.6-45.8 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 45.8-50.2 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 50.2-55.4 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 55.4-60.6 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 60.6-65.7 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 65.7-70.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 70.1-75.0 sec   8.9 KBytes  14.5 Kbits/sec
[  4] 75.0-80.2 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 80.2-85.4 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 85.4-90.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 90.6-95.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 95.0-100.2 sec   9.4 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
```

```
[  4] 100.2-105.4 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 105.4-110.3 sec   8.9 KBytes  14.5 Kbits/sec
[  4] 110.3-115.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 115.5-120.7 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 120.7-125.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 125.1-130.2 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 130.2-135.4 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 135.4-140.6 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 140.6-145.0 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 145.0-150.7 sec  10.3 KBytes  14.6 Kbits/sec
[  4] 150.7-155.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 155.1-160.3 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 160.3-165.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 165.5-170.7 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 170.7-175.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 175.1-180.3 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 180.3-185.2 sec   8.9 KBytes  14.5 Kbits/sec
[  4] 185.2-190.3 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 190.3-195.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 195.5-200.7 sec   9.4 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.7-205.1 sec   8.0 KBytes  14.5 Kbits/sec
[  4] 205.1-210.3 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 210.3-215.5 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 215.5-220.4 sec   8.9 KBytes  14.6 Kbits/sec
[  4] 220.4-225.6 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 225.6-230.8 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 230.8-235.2 sec   8.0 KBytes  14.4 Kbits/sec
[  4] 235.2-240.4 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 240.4-245.6 sec   9.4 KBytes  14.5 Kbits/sec
[  4] 245.6-250.7 sec   9.4 KBytes  14.6 Kbits/sec
[  4]  0.0-251.2 sec   456 KBytes  14.5 Kbits/sec
^C
Script ended - Wed Feb  5 10:54:11 EST 2003

[56] [mobile-gw] >exit
exit

script done on Wed Feb 05 10:54:18 2003
```

```
feb_05_mob_sat_vhf_tx

Script started on Wed Feb 05 10:54:51 2003
[51] [mobile-gw] >./mob_sat_send aatt-temp2

Mobile station - Satellite Transmit

Script started - Wed Feb  5 10:55:06 EST 2003


Starting Pings

PING aatt-temp2: 56 data bytes
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=322. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=341. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=322. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=341. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=322. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=342. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=322. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=342. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=322. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=342. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 322/331/342
PING aatt-temp2: 504 data bytes
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=576. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=576. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=575. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=575. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 575/575/576
PING aatt-temp2: 1016 data bytes
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=865. ms
```

```
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=865. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=866. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=866. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 865/865/866
PING aatt-temp2: 1392 data bytes
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1077. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1078. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1078. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1077/1077/1078
PING aatt-temp2: 1442 data bytes
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1108. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1108. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1107. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1107. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1107/1107/1108
PING aatt-temp2: 2040 data bytes
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1456. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1635. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1749. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=2024. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=2146. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=2269. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=2448. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=2559. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=2835. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=2958. ms
```

```
----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1456/2207/2958
PING aatt-temp2: 4088 data bytes
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=2706. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=4229. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=5460. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=6697. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=8135. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=9485. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=10733. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 7 packets received, 30% packet loss
round-trip (ms)  min/avg/max = 2706/6777/10733

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 16384 bytes
Number of Packets ------- 500
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135000 bytes
Connection made to ------ 139.88.20.33 (aatt-temp2)
Throughput ............   0.24 (Mbits/sec)

Elapsed time: 270.19 seconds    CPU usage:   0%
Xmit: 1.85 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to aatt-temp2, TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 32808 connected with 139.88.20.33 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 6.7 sec   272 KBytes   326 Kbits/sec
[  4]  6.7-18.0 sec   136 KBytes  96.0 Kbits/sec
[  4] 18.0-18.0 sec   8.0 KBytes   259 Mbits/sec
[  4] 18.0-23.1 sec   128 KBytes   202 Kbits/sec
[  4] 23.1-27.4 sec   128 KBytes   237 Kbits/sec
```

```
[  4] 27.4-31.7 sec   136 KBytes   255 Kbits/sec
[  4] 31.7-36.0 sec   128 KBytes   238 Kbits/sec
[  4] 36.0-40.3 sec   136 KBytes   252 Kbits/sec
[  4] 40.3-49.0 sec   264 KBytes   243 Kbits/sec
[  4] 49.0-53.4 sec   136 KBytes   249 Kbits/sec
[  4] 53.4-57.7 sec   128 KBytes   237 Kbits/sec
[  4] 57.7-62.0 sec   136 KBytes   255 Kbits/sec
[  4] 62.0-66.3 sec   128 KBytes   238 Kbits/sec
[  4] 66.3-70.6 sec   136 KBytes   252 Kbits/sec
[  4] 70.6-79.2 sec   264 KBytes   246 Kbits/sec
[  4] 79.2-83.5 sec   136 KBytes   248 Kbits/sec
[  4] 83.5-87.9 sec   128 KBytes   238 Kbits/sec
[  4] 87.9-92.2 sec   136 KBytes   248 Kbits/sec
[  4] 92.2-96.5 sec   136 KBytes   253 Kbits/sec
[  4] 96.5-100.9 sec   128 KBytes   234 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.9-105.4 sec   136 KBytes   244 Kbits/sec
[  4] 105.4-114.0 sec   264 KBytes   244 Kbits/sec
[  4] 114.0-118.3 sec   136 KBytes   255 Kbits/sec
[  4] 118.3-122.6 sec   128 KBytes   238 Kbits/sec
[  4] 122.6-127.0 sec   136 KBytes   248 Kbits/sec
[  4] 127.0-131.3 sec   136 KBytes   253 Kbits/sec
[  4] 131.3-137.3 sec   128 KBytes   172 Kbits/sec
[  4] 137.3-141.6 sec   136 KBytes   253 Kbits/sec
[  4] 141.6-145.9 sec   128 KBytes   237 Kbits/sec
[  4] 145.9-150.2 sec   136 KBytes   255 Kbits/sec
[  4] 150.2-158.9 sec   264 KBytes   243 Kbits/sec
[  4] 158.9-163.2 sec   136 KBytes   253 Kbits/sec
[  4] 163.2-167.6 sec   136 KBytes   248 Kbits/sec
[  4] 167.6-171.9 sec   128 KBytes   238 Kbits/sec
[  4] 171.9-176.2 sec   136 KBytes   252 Kbits/sec
[  4] 176.2-180.5 sec   136 KBytes   255 Kbits/sec
[  4] 180.5-189.1 sec   264 KBytes   243 Kbits/sec
[  4] 189.1-193.4 sec   128 KBytes   238 Kbits/sec
[  4] 193.4-197.8 sec   136 KBytes   252 Kbits/sec
[  4] 197.8-202.0 sec   128 KBytes   240 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 202.0-206.5 sec   136 KBytes   246 Kbits/sec
[  4] 206.5-210.7 sec   136 KBytes   255 Kbits/sec
[  4] 210.7-215.1 sec   128 KBytes   232 Kbits/sec
[  4] 215.1-223.7 sec   264 KBytes   246 Kbits/sec
[  4] 223.7-228.1 sec   136 KBytes   252 Kbits/sec
[  4] 228.1-232.3 sec   128 KBytes   240 Kbits/sec
[  4] 232.3-236.6 sec   136 KBytes   253 Kbits/sec
[  4] 236.6-241.0 sec   128 KBytes   237 Kbits/sec
[  4]  0.0-243.8 sec   7.0 MBytes   235 Kbits/sec

Script ended - Wed Feb  5 11:05:16 EST 2003
[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 11:05:26 2003
```

```
feb_05_mob_vhf_sat_rx

Script started on Wed Feb 05 10:13:26 2003
[51] [mobile-gw] >./mob_sat_recv

Mobile station - Satellite Receive

Script started - Wed Feb  5 10:13:49 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 16384 bytes
Number of Packets ------- 2048
Socket Buffer Size ------ 135000 bytes
REAL Buffer Size -------- 135780 bytes
Connection from --------- 139.88.20.33 (aatt-temp2)
Throughput -------------- 0.93 (Mbits/sec)

Elapsed time: 68.70 seconds    CPU usage:   0%
Received: 3241 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32804
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   750 KBytes   1.2 Mbits/sec
[  4]  5.0-10.0 sec   888 KBytes   1.4 Mbits/sec
[  4] 10.0-15.0 sec   756 KBytes   1.2 Mbits/sec
[  4] 15.0-20.0 sec   777 KBytes   1.2 Mbits/sec
[  4] 20.0-25.0 sec   775 KBytes   1.2 Mbits/sec
[  4] 25.0-30.0 sec   764 KBytes   1.2 Mbits/sec
[  4] 30.0-35.0 sec   781 KBytes   1.2 Mbits/sec
[  4] 35.0-40.0 sec   789 KBytes   1.2 Mbits/sec
[  4] 40.0-45.0 sec   782 KBytes   1.2 Mbits/sec
[  4] 45.0-50.0 sec   857 KBytes   1.3 Mbits/sec
[  4] 50.0-55.0 sec   777 KBytes   1.2 Mbits/sec
[  4] 55.0-60.0 sec   753 KBytes   1.2 Mbits/sec
[  4] 60.0-65.0 sec   755 KBytes   1.2 Mbits/sec
[  4] 65.0-70.0 sec   796 KBytes   1.2 Mbits/sec
[  4] 70.0-75.0 sec   772 KBytes   1.2 Mbits/sec
[  4] 75.0-80.0 sec   788 KBytes   1.2 Mbits/sec
[  4] 80.0-85.0 sec   796 KBytes   1.2 Mbits/sec
[  4] 85.0-90.0 sec   791 KBytes   1.2 Mbits/sec
[  4] 90.0-95.0 sec   819 KBytes   1.3 Mbits/sec
```

```
[  4] 95.0-100.0 sec   813 KBytes   1.3 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   857 KBytes   1.3 Mbits/sec
[  4] 105.0-110.0 sec   791 KBytes   1.2 Mbits/sec
[  4] 110.0-115.0 sec   807 KBytes   1.3 Mbits/sec
[  4] 115.0-120.0 sec   803 KBytes   1.3 Mbits/sec
[  4] 120.0-125.0 sec   793 KBytes   1.2 Mbits/sec
[  4] 125.0-130.0 sec   759 KBytes   1.2 Mbits/sec
[  4] 130.0-135.0 sec   781 KBytes   1.2 Mbits/sec
[  4] 135.0-140.0 sec   764 KBytes   1.2 Mbits/sec
[  4] 140.0-145.0 sec   784 KBytes   1.2 Mbits/sec
[  4] 145.0-150.0 sec   804 KBytes   1.3 Mbits/sec
[  4] 150.0-155.0 sec   803 KBytes   1.3 Mbits/sec
[  4] 155.0-160.0 sec   791 KBytes   1.2 Mbits/sec
[  4] 160.0-165.0 sec   768 KBytes   1.2 Mbits/sec
[  4] 165.0-170.0 sec   821 KBytes   1.3 Mbits/sec
[  4] 170.0-175.0 sec   784 KBytes   1.2 Mbits/sec
[  4] 175.0-180.0 sec   785 KBytes   1.2 Mbits/sec
[  4] 180.0-185.0 sec   828 KBytes   1.3 Mbits/sec
[  4] 185.0-190.0 sec   781 KBytes   1.2 Mbits/sec
[  4] 190.0-195.0 sec   807 KBytes   1.3 Mbits/sec
[  4] 195.0-200.0 sec   739 KBytes   1.2 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.0-205.0 sec   752 KBytes   1.2 Mbits/sec
[  4] 205.0-210.0 sec   752 KBytes   1.2 Mbits/sec
[  4] 210.0-215.0 sec   819 KBytes   1.3 Mbits/sec
[  4] 215.0-220.0 sec   778 KBytes   1.2 Mbits/sec
[  4] 220.0-225.0 sec   831 KBytes   1.3 Mbits/sec
[  4] 225.0-230.0 sec   750 KBytes   1.2 Mbits/sec
[  4] 230.0-235.0 sec   775 KBytes   1.2 Mbits/sec
[  4] 235.0-240.0 sec   755 KBytes   1.2 Mbits/sec
[  4]  0.0-240.2 sec  37.0 MBytes   1.2 Mbits/sec
^C
Script ended - Wed Feb  5 10:21:46 EST 2003

[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 10:21:48 2003
```

```
feb_05_mob_vhf_sat_tx

Script started on Wed Feb 05 10:22:22 2003
[51] [mobile-gw] >./mob_vhf_send aatt-temp2

Mobile station - VHF Transmit

Script started - Wed Feb  5 10:23:08 EST 2003


Starting Pings

PING aatt-temp2: 56 data bytes
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=324. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=324. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 324/324/324
PING aatt-temp2: 504 data bytes
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=564. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=599. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=600. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=599. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=600. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=600. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=599. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=600. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=600. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=600. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 564/596/600
PING aatt-temp2: 1016 data bytes
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=905. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=905. ms
```

```
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=906. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=906. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 905/905/906
PING aatt-temp2: 1392 data bytes
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1139. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1041. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1139. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1041. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1139. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1042. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1139. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1041. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1138. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1042. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1041/1090/1139
PING aatt-temp2: 1442 data bytes
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1166. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1176. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1167. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1174. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1167. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1174. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1166. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1173. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1166. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1172. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1166/1170/1176
PING aatt-temp2: 2040 data bytes
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1551. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1680. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1842. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=2068. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=2205. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=2318. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=2450. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=2612. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=2734. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=2897. ms
```

```
----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1551/2235/2897
PING aatt-temp2: 4088 data bytes
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=2706. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=3941. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=5347. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=6786. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=8137. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=9441. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=10959. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 7 packets received, 30% packet loss
round-trip (ms)  min/avg/max = 2706/6759/10959

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 8192 bytes
Number of Packets ------- 50
REAL Buffer Size -------- 8192 bytes
Connection made to ------ 139.88.20.33 (aatt-temp2)
Throughput ............   0.01 (Mbits/sec)

Elapsed time: 221.26 seconds    CPU usage:   0%
Xmit: 0.23 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to aatt-temp2, TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.12.31 port 32804 connected with 139.88.20.33 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.6 sec  24.0 KBytes  34.5 Kbits/sec
[  4]  5.6-14.3 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 14.3-18.7 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 18.7-23.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 23.1-27.4 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 27.4-31.8 sec   8.0 KBytes  14.6 Kbits/sec
```

```
[  4] 31.8-36.2 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 36.2-40.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 40.6-49.3 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 49.3-53.7 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 53.7-58.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 58.0-62.4 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 62.4-66.8 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 66.8-71.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 71.1-75.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 75.5-84.3 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 84.3-88.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 88.6-93.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 93.0-97.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 97.4-101.7 sec   8.0 KBytes  14.6 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 101.7-106.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 106.1-110.5 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 110.5-119.2 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 119.2-123.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 123.6-128.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 128.0-132.3 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 132.3-136.7 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 136.7-141.1 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 141.1-145.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 145.4-154.2 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 154.2-158.5 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 158.5-162.9 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 162.9-167.3 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 167.3-171.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 171.6-176.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 176.0-180.4 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 180.4-189.1 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 189.1-193.5 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 193.5-197.9 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 197.9-202.3 sec   8.0 KBytes  14.7 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 202.3-206.6 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 206.6-211.0 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 211.0-215.4 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 215.4-224.1 sec  16.0 KBytes  14.6 Kbits/sec
[  4] 224.1-228.5 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 228.5-232.9 sec   8.0 KBytes  14.6 Kbits/sec
[  4] 232.9-237.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 237.2-241.6 sec   8.0 KBytes  14.7 Kbits/sec
[  4]  0.0-249.5 sec   456 KBytes  14.6 Kbits/sec

Script ended - Wed Feb  5 10:32:35 EST 2003
[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 10:32:56 2003
```

```
feb_05_mob_vhf_vhf_rx

Script started on Wed Feb 05 11:07:36 2003
[51] [mobile-gw] >./mob_vhf_recv

Mobile station - VHF Receive

Script started - Wed Feb  5 11:07:41 EST 2003


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Receive
Packet Size ------------- 8192 bytes
Number of Packets ------- 2048
REAL Buffer Size -------- 8760 bytes
Connection from --------- 139.88.20.33 (aatt-temp2)
Throughput -------------- 0.01 (Mbits/sec)

Elapsed time: 221.77 seconds    CPU usage:   0%
Received: 300 pkts


------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32811
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.3 sec   9.4 KBytes  14.4 Kbits/sec
[  4]  5.3-10.4 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 10.4-15.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 15.5-20.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 20.6-25.8 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 25.8-30.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 30.1-35.7 sec  10.3 KBytes  14.8 Kbits/sec
[  4] 35.7-40.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 40.0-45.2 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 45.2-50.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 50.3-55.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 55.4-60.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 60.5-65.3 sec   8.9 KBytes  14.8 Kbits/sec
[  4] 65.3-70.5 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 70.5-75.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 75.6-80.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 80.7-85.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 85.0-90.2 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 90.2-95.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 95.3-100.1 sec   8.9 KBytes  14.8 Kbits/sec
```

```
[ ID] Interval       Transfer     Bandwidth
[  4] 100.1-105.2 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 105.2-110.4 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 110.4-115.5 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 115.5-120.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 120.6-125.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 125.7-130.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 130.1-135.7 sec  10.3 KBytes  14.7 Kbits/sec
[  4] 135.7-140.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 140.1-145.2 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 145.2-150.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 150.3-155.4 sec   9.4 KBytes  14.6 Kbits/sec
[  4] 155.4-160.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 160.5-165.3 sec   8.9 KBytes  14.8 Kbits/sec
[  4] 165.3-170.5 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 170.5-175.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 175.6-180.7 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 180.7-185.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 185.1-190.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 190.2-195.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 195.3-200.1 sec   8.9 KBytes  14.7 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.1-205.3 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 205.3-210.4 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 210.4-215.5 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 215.5-220.6 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 220.6-225.8 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 225.8-230.1 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 230.1-235.7 sec  10.3 KBytes  14.7 Kbits/sec
[  4] 235.7-240.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 240.0-245.2 sec   9.4 KBytes  14.7 Kbits/sec
[  4]  0.0-247.9 sec   456 KBytes  14.7 Kbits/sec
^C
Script ended - Wed Feb  5 11:17:40 EST 2003

[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 11:17:41 2003
```

```
feb_05_mob_vhf_vhf_tx

Script started on Wed Feb 05 11:18:01 2003
[51] [mobile-gw] >./mob_vhf_send aatt-temp2

Mobile station - VHF Transmit

Script started - Wed Feb  5 11:18:08 EST 2003


Starting Pings

PING aatt-temp2: 56 data bytes
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=132. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=131. ms
64 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=131. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 131/131/132
PING aatt-temp2: 504 data bytes
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=606. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=606. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=606. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=607. ms
512 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=606. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 606/606/607
PING aatt-temp2: 1016 data bytes
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1151. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1151. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1218. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1284. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1151. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1152. ms
```

```
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1152. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1151. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1151. ms
1024 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1152. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1151/1171/1284
PING aatt-temp2: 1392 data bytes
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1553. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1551. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1551. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1552. ms
1400 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1553. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1551/1552/1553
PING aatt-temp2: 1442 data bytes
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=1606. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=1607. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=1608. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=1607. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=1607. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=1606. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=1606. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=1607. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=1606. ms
1450 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=1607. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 1606/1606/1608
PING aatt-temp2: 2040 data bytes
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=2266. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=2380. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=2492. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=2604. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=2716. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=2828. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=2940. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=7. time=3052. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=8. time=3164. ms
2048 bytes from aatt-temp2 (139.88.20.33): icmp_seq=9. time=3276. ms
```

```
----aatt-temp2 PING Statistics----
10 packets transmitted, 10 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 2266/2771/3276
PING aatt-temp2: 4088 data bytes
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=0. time=4485. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=1. time=5872. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=2. time=7083. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=3. time=8294. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=4. time=9505. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=5. time=10716. ms
4096 bytes from aatt-temp2 (139.88.20.33): icmp_seq=6. time=11926. ms

----aatt-temp2 PING Statistics----
10 packets transmitted, 7 packets received, 30% packet loss
round-trip (ms)  min/avg/max = 4485/8268/11926

Starting TTCP


          TTCP PERFORMANCE

Mode -------------------- TCP  -  Transmit
Packet Size ------------- 8192 bytes
Number of Packets ------- 50
REAL Buffer Size -------- 8192 bytes
Connection made to ------ 139.88.20.33 (aatt-temp2)
Throughput ............   0.01 (Mbits/sec)

Elapsed time: 214.41 seconds    CPU usage:   0%
Xmit: 0.23 pkts/sec

Sleeping for 15 seconds


Starting IPerf

------------------------------------------------------------
Client connecting to aatt-temp2, TCP port 5001
TCP window size:  8.0 KByte (default)
------------------------------------------------------------
[  4] local 139.88.12.31 port 32811 connected with 139.88.20.33 port 5001
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.3 sec  24.0 KBytes  36.3 Kbits/sec
[  4]  5.3-13.9 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 13.9-18.2 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 18.2-22.6 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 22.6-26.9 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 26.9-31.2 sec   8.0 KBytes  14.9 Kbits/sec
```

```
[  4] 31.2-35.5 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 35.5-44.1 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 44.1-48.5 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 48.5-52.8 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 52.8-57.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 57.1-61.4 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 61.4-65.7 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 65.7-70.0 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 70.0-78.7 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 78.7-83.0 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 83.0-87.3 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 87.3-91.6 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 91.6-95.9 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 95.9-100.2 sec   8.0 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.2-108.9 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 108.9-113.2 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 113.2-117.5 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 117.5-121.8 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 121.8-126.1 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 126.1-130.4 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 130.4-139.1 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 139.1-143.4 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 143.4-147.7 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 147.7-152.0 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 152.0-156.4 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 156.4-160.7 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 160.7-169.3 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 169.3-173.6 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 173.6-178.0 sec   8.0 KBytes  14.7 Kbits/sec
[  4] 178.0-182.3 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 182.3-186.6 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 186.6-190.9 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 190.9-195.2 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 195.2-203.9 sec  16.0 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 203.9-208.2 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 208.2-212.5 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 212.5-216.8 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 216.8-221.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 221.1-225.4 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 225.4-234.1 sec  16.0 KBytes  14.8 Kbits/sec
[  4] 234.1-238.4 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 238.4-242.7 sec   8.0 KBytes  14.8 Kbits/sec
[  4]  0.0-250.5 sec   464 KBytes  14.8 Kbits/sec

Script ended - Wed Feb  5 11:27:32 EST 2003
[52] [mobile-gw] >exit
exit

script done on Wed Feb 05 11:27:34 2003
```

```
feb_26_mob_vhf_vhf_rx_failover.1

Script started on Wed Feb 26 10:36:21 2003
[54] [mobile-gw] >iperf -w 135000 -i 5 -t 360 -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32880
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.6 sec   9.4 KBytes  13.5 Kbits/sec
[  4]  5.6-10.1 sec   8.0 KBytes  14.3 Kbits/sec
[  4] 10.1-15.4 sec   9.4 KBytes  14.1 Kbits/sec
[  4] 15.4-20.8 sec   9.4 KBytes  14.2 Kbits/sec
[  4] 20.8-25.3 sec   8.0 KBytes  14.2 Kbits/sec
[  4] 25.3-30.6 sec   9.4 KBytes  14.1 Kbits/sec
[  4] 30.6-35.1 sec   8.0 KBytes  14.2 Kbits/sec
[  4] 35.1-40.1 sec   6.6 KBytes  10.6 Kbits/sec
[  4] 40.1-45.5 sec   9.4 KBytes  13.9 Kbits/sec
[  4] 45.5-50.8 sec   9.4 KBytes  14.2 Kbits/sec
[  4] 50.8-55.3 sec   8.0 KBytes  14.2 Kbits/sec
[  4] 55.3-60.3 sec   8.9 KBytes  14.1 Kbits/sec
[  4] 60.3-65.6 sec   9.4 KBytes  14.2 Kbits/sec
[  4] 65.6-86.2 sec   4.3 KBytes   1.7 Kbits/sec
[  4] 86.2-86.8 sec   2.9 KBytes  36.3 Kbits/sec
[  4] 86.8-87.3 sec   2.9 KBytes  43.3 Kbits/sec
[  4] 87.3-87.4 sec   1.4 KBytes   441 Kbits/sec
[  4] 87.4-90.1 sec  69.9 KBytes   205 Kbits/sec
[  4] 90.1-95.0 sec   592 KBytes   961 Kbits/sec
[  4] 95.0-100.1 sec   660 KBytes   1.0 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.1-105.0 sec   697 KBytes   1.1 Mbits/sec
[  4] 105.0-110.0 sec   774 KBytes   1.2 Mbits/sec
[  4] 110.0-115.0 sec   810 KBytes   1.3 Mbits/sec
[  4] 115.0-120.0 sec   878 KBytes   1.4 Mbits/sec
[  4] 120.0-125.0 sec   936 KBytes   1.5 Mbits/sec
[  4] 125.0-130.0 sec   984 KBytes   1.5 Mbits/sec
[  4] 130.0-135.0 sec   1.0 MBytes   1.6 Mbits/sec
[  4] 135.0-140.0 sec   1.1 MBytes   1.7 Mbits/sec
[  4] 140.0-145.0 sec   1.1 MBytes   1.8 Mbits/sec
[  4] 145.0-150.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 150.0-155.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 155.0-160.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 160.0-165.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 165.0-170.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 170.0-175.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 175.0-180.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 180.0-185.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 185.0-190.0 sec   1.2 MBytes   1.9 Mbits/sec
```

```
[  4] 190.0-195.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 195.0-200.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.0-205.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 205.0-210.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 210.0-215.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 215.0-220.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 220.0-225.2 sec   739 KBytes   1.1 Mbits/sec
[  4] 225.2-230.5 sec   9.4 KBytes  14.1 Kbits/sec
[  4] 230.5-235.0 sec   8.0 KBytes  14.2 Kbits/sec
[  4] 235.0-240.0 sec   8.9 KBytes  14.2 Kbits/sec
[  4] 240.0-245.4 sec   9.4 KBytes  14.0 Kbits/sec
[  4] 245.4-250.7 sec   9.4 KBytes  14.1 Kbits/sec
[  4] 250.7-255.2 sec   8.0 KBytes  14.3 Kbits/sec
[  4] 255.2-260.6 sec   9.4 KBytes  14.1 Kbits/sec
[  4] 260.6-265.1 sec   8.0 KBytes  14.3 Kbits/sec
[  4] 265.1-270.5 sec   9.4 KBytes  13.9 Kbits/sec
[  4] 270.5-310.8 sec   2.5 KBytes   515 bits/sec
[  4] 310.8-311.5 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 311.5-312.0 sec   892 Bytes  14.3 Kbits/sec
[  4] 312.0-312.8 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 312.8-313.6 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 313.6-314.3 sec   1.4 KBytes  14.9 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 314.3-315.1 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 315.1-315.9 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 315.9-316.3 sec   892 Bytes  14.8 Kbits/sec
[  4] 316.3-331.6 sec   9.4 KBytes   4.9 Kbits/sec
[  4] 331.6-333.1 sec   568 Bytes   2.9 Kbits/sec
[  4] 333.1-333.9 sec   1.4 KBytes  14.6 Kbits/sec
[  4] 333.9-335.4 sec   2.9 KBytes  14.9 Kbits/sec
[  4] 335.4-340.1 sec   8.6 KBytes  14.9 Kbits/sec
[  4] 340.1-345.4 sec  10.0 KBytes  14.9 Kbits/sec
[  4] 345.4-350.3 sec   8.9 KBytes  14.8 Kbits/sec
[  4] 350.3-355.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 355.4-360.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 360.4-365.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 365.2-370.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 370.3-375.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 375.3-380.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 380.4-385.6 sec   8.0 KBytes  12.4 Kbits/sec
[  4] 385.6-390.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 390.7-395.7 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 395.7-400.1 sec   8.0 KBytes  14.7 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 400.1-405.6 sec  10.3 KBytes  14.9 Kbits/sec
[  4] 405.6-410.8 sec   9.4 KBytes  14.7 Kbits/sec
[  4] 410.8-415.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4]  0.0-417.8 sec  28.5 MBytes   559 Kbits/sec
```

```
^C
[55] [mobile-gw] >exit
exit

script done on Wed Feb 26 10:44:12 2003
```

```
feb_26_mob_sat_sat_rx_failover.2

Script started on Wed Feb 26 10:46:49 2003
[51] [mobile-gw] >iperf -w 135000 -i 5 -t 360 -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32903
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   318 KBytes   508 Kbits/sec
[  4]  5.0-10.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 10.0-15.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.0-20.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 20.0-25.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.0-30.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.0-35.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.0-40.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.0-45.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 45.0-50.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.0-55.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.0-60.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.0-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 70.0-75.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.0-80.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.0-85.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.0-90.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 90.0-95.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 95.0-100.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 105.0-110.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 110.0-115.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 115.0-120.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 120.0-125.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 125.0-130.5 sec   531 KBytes   776 Kbits/sec
[  4] 130.5-135.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 135.5-140.3 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 140.3-145.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 145.4-150.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 150.5-155.6 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 155.6-199.5 sec   9.1 KBytes   1.7 Kbits/sec
[  4] 199.5-200.2 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 200.2-201.0 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 201.0-201.5 sec   892 Bytes  14.9 Kbits/sec
[  4] 201.5-206.6 sec   892 Bytes   1.4 Kbits/sec
[  4] 206.6-207.3 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 207.3-208.1 sec   1.4 KBytes  14.9 Kbits/sec
```

```
[  4] 208.1-213.2 sec   568 Bytes   892 bits/sec
[  4] 213.2-213.7 sec   892 Bytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 213.7-214.4 sec   1.4 KBytes  14.8 Kbits/sec
[  4] 214.4-215.2 sec   1.4 KBytes  14.7 Kbits/sec
[  4] 215.2-216.0 sec   1.4 KBytes  14.7 Kbits/sec
[  4] 216.0-220.1 sec   7.7 KBytes  14.9 Kbits/sec
[  4] 220.1-225.2 sec  16.6 KBytes  26.1 Kbits/sec
[  4] 225.2-230.9 sec  18.9 KBytes  26.7 Kbits/sec
[  4] 230.9-235.5 sec   8.6 KBytes  14.9 Kbits/sec
[  4] 235.5-240.3 sec   8.9 KBytes  14.7 Kbits/sec
[  4] 240.3-245.1 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 245.1-250.1 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 250.1-255.2 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 255.2-260.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 260.3-265.4 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 265.4-270.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 270.5-275.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 275.2-280.8 sec   9.4 KBytes  13.4 Kbits/sec
[  4] 280.8-285.4 sec   8.0 KBytes  14.0 Kbits/sec
[  4] 285.4-290.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 290.5-295.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 295.5-300.6 sec   9.4 KBytes  14.9 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 300.6-305.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 305.7-337.1 sec   2.3 KBytes   599 bits/sec
[  4] 337.1-337.8 sec   2.9 KBytes  36.3 Kbits/sec
[  4] 337.8-338.3 sec   2.9 KBytes  43.3 Kbits/sec
[  4] 338.3-338.3 sec   1.4 KBytes   445 Kbits/sec
[  4] 338.3-338.8 sec   2.9 KBytes  45.5 Kbits/sec
[  4] 338.8-338.8 sec   1.4 KBytes   605 Kbits/sec
[  4] 338.8-340.1 sec  11.2 KBytes  71.0 Kbits/sec
[  4] 340.1-345.2 sec  84.3 KBytes   131 Kbits/sec
[  4] 345.2-350.1 sec   129 KBytes   213 Kbits/sec
[  4] 350.1-355.1 sec   186 KBytes   295 Kbits/sec
[  4] 355.1-360.0 sec   233 KBytes   383 Kbits/sec
[  4]  0.0-362.2 sec  30.6 MBytes   693 Kbits/sec
```

```
feb_26_mob_sat_sat_rx_failover.3

[52] [mobile-gw] >iperf -w 135000 -i 5 -t 360 -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32904
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   315 KBytes   503 Kbits/sec
[  4]  5.0-10.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 10.0-15.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.0-20.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 20.0-25.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.0-30.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.0-35.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.0-40.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.0-45.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 45.0-50.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.0-55.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.0-60.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.0-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 70.0-75.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.0-80.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.0-85.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.0-90.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 90.0-95.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 95.0-100.2 sec   388 KBytes   597 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.2-105.8 sec  10.3 KBytes  14.9 Kbits/sec
[  4] 105.8-110.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 110.1-115.1 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 115.1-120.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 120.2-125.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 125.3-130.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 130.4-135.1 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 135.1-180.7 sec   2.9 KBytes   512 bits/sec
[  4] 180.7-181.5 sec   1.4 KBytes  14.6 Kbits/sec
[  4] 181.5-185.8 sec   5.1 KBytes   9.5 Kbits/sec
[  4] 185.8-188.1 sec   1.4 KBytes   4.9 Kbits/sec
[  4] 188.1-188.9 sec   1.4 KBytes  14.5 Kbits/sec
[  4] 188.9-189.7 sec   1.4 KBytes  15.3 Kbits/sec
[  4] 189.7-190.4 sec   1.4 KBytes  14.9 Kbits/sec
[  4] 190.4-190.9 sec   892 Bytes  14.9 Kbits/sec
[  4] 190.9-191.7 sec   1.4 KBytes  14.5 Kbits/sec
[  4] 191.7-192.5 sec   1.4 KBytes  15.0 Kbits/sec
[  4] 192.5-193.2 sec   1.4 KBytes  14.8 Kbits/sec
[  4] 193.2-195.2 sec   3.7 KBytes  15.0 Kbits/sec
```

```
[  4] 195.2-200.3 sec   9.4 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.3-205.4 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 205.4-210.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 210.5-215.3 sec   8.0 KBytes  13.3 Kbits/sec
[  4] 215.3-242.3 sec   9.4 KBytes   2.8 Kbits/sec
[  4] 242.3-242.9 sec   2.9 KBytes  36.3 Kbits/sec
[  4] 242.9-243.4 sec   2.9 KBytes  43.3 Kbits/sec
[  4] 243.4-243.5 sec   1.4 KBytes   442 Kbits/sec
[  4] 243.5-244.0 sec   2.9 KBytes  45.5 Kbits/sec
[  4] 244.0-245.0 sec   8.3 KBytes  63.3 Kbits/sec
[  4] 245.0-250.1 sec  68.3 KBytes   108 Kbits/sec
[  4] 250.1-255.0 sec   116 KBytes   188 Kbits/sec
[  4] 255.0-260.2 sec   176 KBytes   272 Kbits/sec
[  4] 260.2-265.0 sec   228 KBytes   378 Kbits/sec
[  4] 265.0-270.0 sec   287 KBytes   460 Kbits/sec
[  4] 270.0-275.0 sec   328 KBytes   522 Kbits/sec
[  4] 275.0-280.0 sec   381 KBytes   609 Kbits/sec
[  4] 280.0-285.0 sec   441 KBytes   708 Kbits/sec
[  4] 285.0-290.0 sec   489 KBytes   785 Kbits/sec
[  4] 290.0-295.0 sec   544 KBytes   871 Kbits/sec
[  4] 295.0-300.0 sec   603 KBytes   966 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 300.0-305.0 sec   656 KBytes   1.0 Mbits/sec
[  4] 305.0-310.0 sec   708 KBytes   1.1 Mbits/sec
[  4] 310.0-315.0 sec   755 KBytes   1.2 Mbits/sec
[  4] 315.0-320.0 sec   820 KBytes   1.3 Mbits/sec
[  4] 320.0-325.0 sec   870 KBytes   1.4 Mbits/sec
[  4] 325.0-330.0 sec   925 KBytes   1.4 Mbits/sec
[  4] 330.0-335.0 sec   983 KBytes   1.5 Mbits/sec
[  4] 335.0-340.0 sec   1.0 MBytes   1.6 Mbits/sec
[  4] 340.0-345.0 sec   1.1 MBytes   1.7 Mbits/sec
[  4] 345.0-350.0 sec   1.1 MBytes   1.8 Mbits/sec
[  4] 350.0-355.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 355.0-360.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4]  0.0-360.4 sec  37.2 MBytes   846 Kbits/sec
```

```
feb_26_mob_sat_sat_rx_failover.4

[53] [mobile-gw] >iperf -w 135000 -i 5 -t 360 -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32905
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   312 KBytes   499 Kbits/sec
[  4]  5.0-10.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 10.0-15.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.0-20.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 20.0-25.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.0-30.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.0-35.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.0-40.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.0-45.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 45.0-50.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.0-55.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.0-60.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.0-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 70.0-75.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.0-80.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.0-85.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.0-90.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 90.0-95.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 95.0-100.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 105.0-110.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 110.0-115.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 115.0-120.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 120.0-125.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 125.0-130.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 130.0-135.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 135.0-140.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 140.0-145.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 145.0-150.3 sec   197 KBytes   297 Kbits/sec
[  4] 150.3-155.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 155.4-160.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 160.5-165.6 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 165.6-206.7 sec   9.1 KBytes   1.8 Kbits/sec
[  4] 206.7-207.4 sec   1.4 KBytes  17.0 Kbits/sec
[  4] 207.4-207.9 sec   892 Bytes  14.9 Kbits/sec
[  4] 207.9-208.7 sec   1.4 KBytes  14.6 Kbits/sec
[  4] 208.7-209.4 sec   1.4 KBytes  14.8 Kbits/sec
[  4] 209.4-210.2 sec   1.4 KBytes  14.8 Kbits/sec
```

```
[  4] 210.2-211.0 sec   1.4 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 211.0-211.7 sec   1.4 KBytes  14.6 Kbits/sec
[  4] 211.7-212.5 sec   1.4 KBytes  14.8 Kbits/sec
[  4] 212.5-215.3 sec   5.1 KBytes  14.9 Kbits/sec
[  4] 215.3-225.8 sec   568 Bytes   430 bits/sec
[  4] 225.8-226.2 sec   892 Bytes  18.5 Kbits/sec
[  4] 226.2-230.1 sec   7.1 KBytes  14.8 Kbits/sec
[  4] 230.1-235.1 sec   9.2 KBytes  14.7 Kbits/sec
[  4] 235.1-240.6 sec  10.3 KBytes  14.9 Kbits/sec
[  4] 240.6-245.7 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 245.7-250.7 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 250.7-255.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 255.1-260.1 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 260.1-265.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 265.2-270.8 sec  10.3 KBytes  14.9 Kbits/sec
[  4] 270.8-275.1 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 275.1-280.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 280.2-285.2 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 285.2-290.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 290.3-295.2 sec   8.0 KBytes  13.2 Kbits/sec
[  4] 295.2-300.3 sec   9.4 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 300.3-305.0 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 305.0-310.1 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 310.1-315.2 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 315.2-320.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 320.3-325.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 325.4-330.4 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 330.4-335.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 335.2-340.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 340.3-345.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 345.4-350.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 350.4-355.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 355.5-360.6 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 360.6-365.4 sec   8.0 KBytes  13.3 Kbits/sec
[  4] 365.4-414.4 sec   3.7 KBytes   623 bits/sec
[  4] 414.4-415.0 sec   2.9 KBytes  36.3 Kbits/sec
[  4] 415.0-415.5 sec   2.9 KBytes  43.3 Kbits/sec
[  4] 415.5-415.6 sec   1.4 KBytes   445 Kbits/sec
[  4] 415.6-416.1 sec   2.9 KBytes  45.5 Kbits/sec
[  4] 416.1-416.1 sec   1.4 KBytes   600 Kbits/sec
[  4] 416.1-416.2 sec   2.9 KBytes   214 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 416.2-416.6 sec   2.9 KBytes  56.9 Kbits/sec
[  4] 416.6-416.6 sec   1.4 KBytes   508 Kbits/sec
[  4] 416.6-416.7 sec   2.9 KBytes   235 Kbits/sec
[  4] 416.7-420.0 sec  57.2 KBytes   139 Kbits/sec
[  4] 420.0-425.1 sec   127 KBytes   199 Kbits/sec
```

```
[  4] 425.1-430.1 sec   183 KBytes   292 Kbits/sec
[  4] 430.1-435.1 sec   239 KBytes   384 Kbits/sec
[  4] 435.1-440.0 sec   285 KBytes   464 Kbits/sec
[  4] 440.0-445.0 sec   335 KBytes   536 Kbits/sec
[  4] 445.0-450.0 sec   391 KBytes   623 Kbits/sec
[  4] 450.0-455.1 sec   451 KBytes   716 Kbits/sec
[  4] 455.1-460.1 sec   500 KBytes   800 Kbits/sec
[  4] 460.1-465.0 sec   551 KBytes   890 Kbits/sec
[  4] 465.0-470.0 sec   613 KBytes   983 Kbits/sec
[  4] 470.0-475.0 sec   659 KBytes   1.0 Mbits/sec
[  4] 475.0-480.0 sec   714 KBytes   1.1 Mbits/sec
[  4] 480.0-485.0 sec   763 KBytes   1.2 Mbits/sec
[  4] 485.0-490.0 sec   829 KBytes   1.3 Mbits/sec
[  4] 490.0-495.0 sec   875 KBytes   1.4 Mbits/sec
[  4] 495.0-500.0 sec   936 KBytes   1.5 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 500.0-505.0 sec   995 KBytes   1.6 Mbits/sec
[  4] 505.0-510.0 sec   1.0 MBytes   1.6 Mbits/sec
[  4] 510.0-515.0 sec   1.1 MBytes   1.7 Mbits/sec
[  4] 515.0-520.0 sec   1.1 MBytes   1.8 Mbits/sec
[  4] 520.0-525.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 525.0-530.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 530.0-535.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 535.0-540.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 540.0-545.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 545.0-550.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 550.0-555.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 555.0-560.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 560.0-565.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 565.0-570.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 570.0-575.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 575.0-580.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 580.0-585.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 585.0-590.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 590.0-595.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 595.0-600.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 600.0-605.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 605.0-610.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 610.0-615.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 615.0-620.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 620.0-625.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 625.0-630.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 630.0-635.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 635.0-640.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 640.0-645.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 645.0-650.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 650.0-655.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 655.0-660.0 sec   1.2 MBytes   1.9 Mbits/sec
```

```
[  4] 660.0-665.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 665.0-670.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 670.0-675.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 675.0-680.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 680.0-685.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 685.0-690.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 690.0-695.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 695.0-700.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 700.0-705.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 705.0-710.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 710.0-715.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 715.0-720.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4]  0.0-720.2 sec  94.9 MBytes   1.1 Mbits/sec
```

```
feb_26_mob_sat_sat_rx_failover.5

[54] [mobile-gw] >iperf -w 135000 -i 5 -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  132 KByte
------------------------------------------------------------
[  4] local 139.88.12.31 port 5001 connected with 139.88.20.33 port 32906
[ ID] Interval       Transfer     Bandwidth
[  4]  0.0- 5.0 sec   318 KBytes   508 Kbits/sec
[  4]  5.0-10.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 10.0-15.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 15.0-20.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 20.0-25.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 25.0-30.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 30.0-35.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 35.0-40.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 40.0-45.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 45.0-50.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 50.0-55.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 55.0-60.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 60.0-65.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 65.0-70.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 70.0-75.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 75.0-80.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 80.0-85.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 85.0-90.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 90.0-95.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 95.0-100.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 100.0-105.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 105.0-110.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 110.0-115.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 115.0-120.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 120.0-125.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 125.0-130.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 130.0-135.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 135.0-140.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 140.0-145.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 145.0-150.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 150.0-155.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 155.0-160.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 160.0-165.7 sec   952 KBytes   1.3 Mbits/sec
[  4] 165.7-170.7 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 170.7-175.0 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 175.0-180.1 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 180.1-185.2 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 185.2-190.8 sec  10.3 KBytes  14.8 Kbits/sec
[  4] 190.8-195.1 sec   8.0 KBytes  14.8 Kbits/sec
```

```
[  4] 195.1-200.1 sec   9.4 KBytes  14.9 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 200.1-246.4 sec   4.3 KBytes   758 bits/sec
[  4] 246.4-246.8 sec   892 Bytes  14.9 Kbits/sec
[  4] 246.8-251.5 sec   568 Bytes   983 bits/sec
[  4] 251.5-252.2 sec   6.6 KBytes  68.6 Kbits/sec
[  4] 252.2-254.3 sec   892 Bytes   3.4 Kbits/sec
[  4] 254.3-255.0 sec   1.4 KBytes  14.8 Kbits/sec
[  4] 255.0-255.8 sec   1.4 KBytes  14.6 Kbits/sec
[  4] 255.8-256.6 sec   1.4 KBytes  15.1 Kbits/sec
[  4] 256.6-257.3 sec   1.4 KBytes  14.5 Kbits/sec
[  4] 257.3-258.1 sec   1.4 KBytes  15.3 Kbits/sec
[  4] 258.1-258.6 sec   892 Bytes  14.8 Kbits/sec
[  4] 258.6-260.1 sec   2.9 KBytes  14.7 Kbits/sec
[  4] 260.1-265.2 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 265.2-270.8 sec   9.4 KBytes  13.4 Kbits/sec
[  4] 270.8-275.1 sec   8.0 KBytes  14.8 Kbits/sec
[  4] 275.1-280.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 280.2-285.8 sec  10.3 KBytes  14.9 Kbits/sec
[  4] 285.8-290.1 sec   8.0 KBytes  14.9 Kbits/sec
[  4] 290.1-295.1 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 295.1-300.2 sec   9.4 KBytes  14.8 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 300.2-305.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 305.3-310.4 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 310.4-315.1 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 315.1-320.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 320.2-325.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 325.3-330.4 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 330.4-335.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 335.5-340.3 sec   8.0 KBytes  13.3 Kbits/sec
[  4] 340.3-345.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 345.4-350.1 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 350.1-355.2 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 355.2-360.3 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 360.3-365.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 365.4-370.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 370.5-375.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 375.5-380.3 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 380.3-385.4 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 385.4-390.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 390.5-395.5 sec   9.4 KBytes  14.9 Kbits/sec
[  4] 395.5-400.6 sec   9.4 KBytes  14.9 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 400.6-405.4 sec   8.0 KBytes  13.4 Kbits/sec
[  4] 405.4-410.5 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 410.5-415.2 sec   8.9 KBytes  14.9 Kbits/sec
[  4] 415.2-420.3 sec   9.4 KBytes  14.8 Kbits/sec
[  4] 420.3-425.4 sec   9.4 KBytes  14.9 Kbits/sec
```

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[  4] 425.4-471.6 sec   4.3 KBytes   759 bits/sec
[  4] 471.6-472.2 sec   2.9 KBytes  36.3 Kbits/sec
[  4] 472.2-472.7 sec   2.9 KBytes  43.3 Kbits/sec
[  4] 472.7-472.8 sec   1.4 KBytes   443 Kbits/sec
[  4] 472.8-473.3 sec   2.9 KBytes  45.6 Kbits/sec
[  4] 473.3-473.3 sec   1.4 KBytes   595 Kbits/sec
[  4] 473.3-473.4 sec   2.9 KBytes   214 Kbits/sec
[  4] 473.4-473.8 sec   2.9 KBytes  56.9 Kbits/sec
[  4] 473.8-473.8 sec   1.4 KBytes   505 Kbits/sec
[  4] 473.8-475.1 sec  21.5 KBytes   134 Kbits/sec
[  4] 475.1-480.1 sec   104 KBytes   167 Kbits/sec
[  4] 480.1-485.1 sec   157 KBytes   249 Kbits/sec
[  4] 485.1-490.0 sec   209 KBytes   343 Kbits/sec
[  4] 490.0-495.0 sec   266 KBytes   426 Kbits/sec
[  4] 495.0-500.0 sec   312 KBytes   495 Kbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 500.0-505.0 sec   374 KBytes   602 Kbits/sec
[  4] 505.0-510.0 sec   426 KBytes   683 Kbits/sec
[  4] 510.0-515.0 sec   478 KBytes   765 Kbits/sec
[  4] 515.0-520.0 sec   546 KBytes   866 Kbits/sec
[  4] 520.0-525.0 sec   591 KBytes   953 Kbits/sec
[  4] 525.0-530.0 sec   652 KBytes   1.0 Mbits/sec
[  4] 530.0-535.0 sec   692 KBytes   1.1 Mbits/sec
[  4] 535.0-540.0 sec   749 KBytes   1.2 Mbits/sec
[  4] 540.0-545.0 sec   815 KBytes   1.3 Mbits/sec
[  4] 545.0-550.0 sec   856 KBytes   1.3 Mbits/sec
[  4] 550.0-555.0 sec   923 KBytes   1.4 Mbits/sec
[  4] 555.0-560.0 sec   970 KBytes   1.5 Mbits/sec
[  4] 560.0-565.0 sec   1.0 MBytes   1.6 Mbits/sec
[  4] 565.0-570.0 sec   1.1 MBytes   1.7 Mbits/sec
[  4] 570.0-575.0 sec   1.1 MBytes   1.8 Mbits/sec
[  4] 575.0-580.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 580.0-585.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 585.0-590.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 590.0-595.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 595.0-600.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 600.0-605.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 605.0-610.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 610.0-615.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 615.0-620.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 620.0-625.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 625.0-630.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 630.0-635.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 635.0-640.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 640.0-645.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 645.0-650.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 650.0-655.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 655.0-660.0 sec   1.2 MBytes   1.9 Mbits/sec
```

```
[  4] 660.0-665.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 665.0-670.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 670.0-675.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 675.0-680.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 680.0-685.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 685.0-690.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 690.0-695.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 695.0-700.0 sec   1.2 MBytes   1.9 Mbits/sec
[ ID] Interval       Transfer     Bandwidth
[  4] 700.0-705.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 705.0-710.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 710.0-715.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4] 715.0-720.0 sec   1.2 MBytes   1.9 Mbits/sec
[  4]  0.0-720.5 sec  85.8 MBytes   975 Kbits/sec
```

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13. ABSTRACT ***(Maximum 200 words)***
This work presents a short report on the routing tests of the Ku band satcom and VHF line-of-sight communications systems on the Advanced Air Transportation Technologies (AATT) Aero/Mobile van. The first section is a description of the equipment used, followed by descriptions of the tests, the theoretical results, and finally, conclusions and the actual data.

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