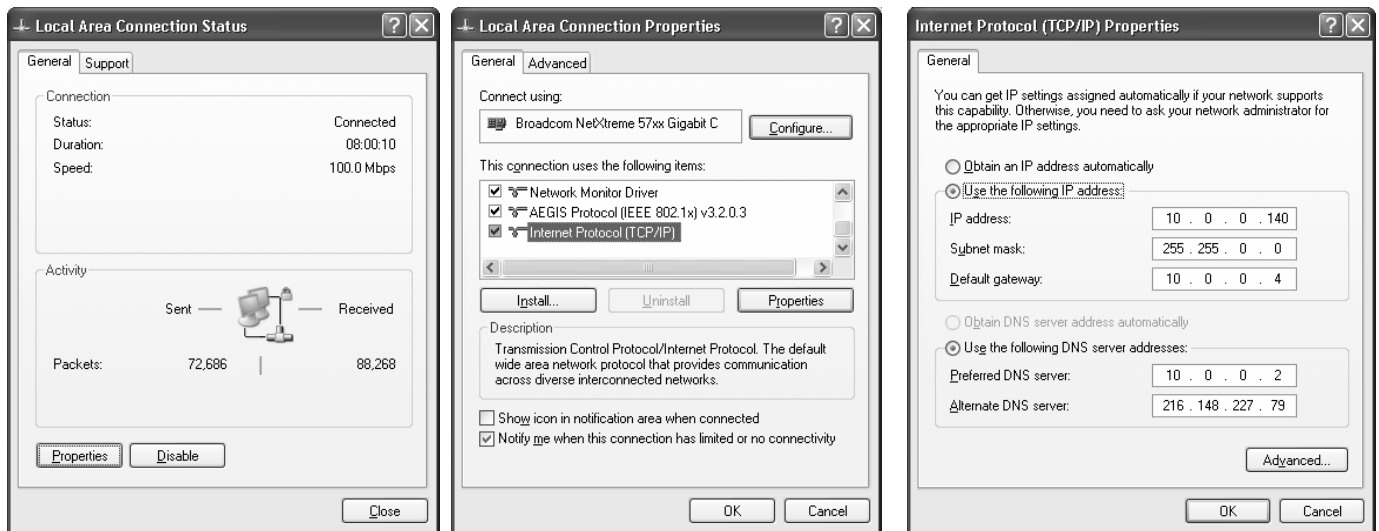


INSTALLATION AND OPERATION MANUAL ADDENDUM

The realMOS™ Server is the required software application for VoIP+ testing. It is run on a user supplied server, connected to the Ethernet network near the Media Gateway to receive and transmit UDP/RTP voice data packets to and from the CM Series meter to test both the upstream and downstream. Upstream data is transferred back to the CM via a TCP/IP network connection. realMOS also provides the downstream voice data for field analysis.

Installing realMOS

1. Download the software installation package from:
<http://64.227.161.64/PCIP/SetupRealMos.exe> (save it to your desktop)
2. Install the Software (double click on the installation package just downloaded and follow the on screen prompts)
3. Connect the PC to the network.

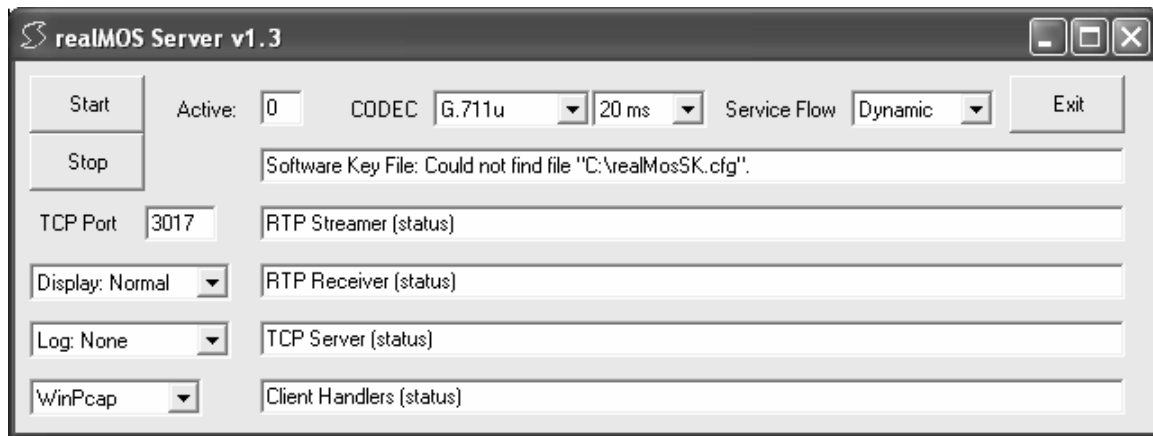


4. A public static IP is required. Setup the static IP information (per IT administrator instruction) – the IP must be public routable (reachable from the public side of the network) - you will need an IP address, subnet mask and gateway for PC setup). See your network administrator for special considerations on security. Windows XP instructions follow:
 - A. Click on Control Panel
 - B. Click on Network Connections and then Local Area Connection (opens Local Area Connection Status)
 - C. Click on Properties (opens Local Area Connection Properties)
 - D. Uncheck the boxes for Client for Microsoft Networks and Files and Print Sharing
 - E. Select the Internet Protocol Connection (TCP/IP)
 - F. Select Properties (opens Internet Protocol (TCP/IP) properties)
 - G. Click on the radio button for “Use the following IP address”. This address must be on the public IP or routed from the public IP to the Server.
 - H. Enter the Static IP Address

- I. Enter the Subnet Mask
- J. Enter the Gateway
- K. Click OK on Internet Protocol Properties to save the settings.
- L. Click OK on the Local Area Connection Properties to save the settings.
- M. Check the Local Area Connection Status screen - it should indicate a network connection and then close this screen.
- N. Close the Network Connections screen. You are ready to setup the realMOS Server software.

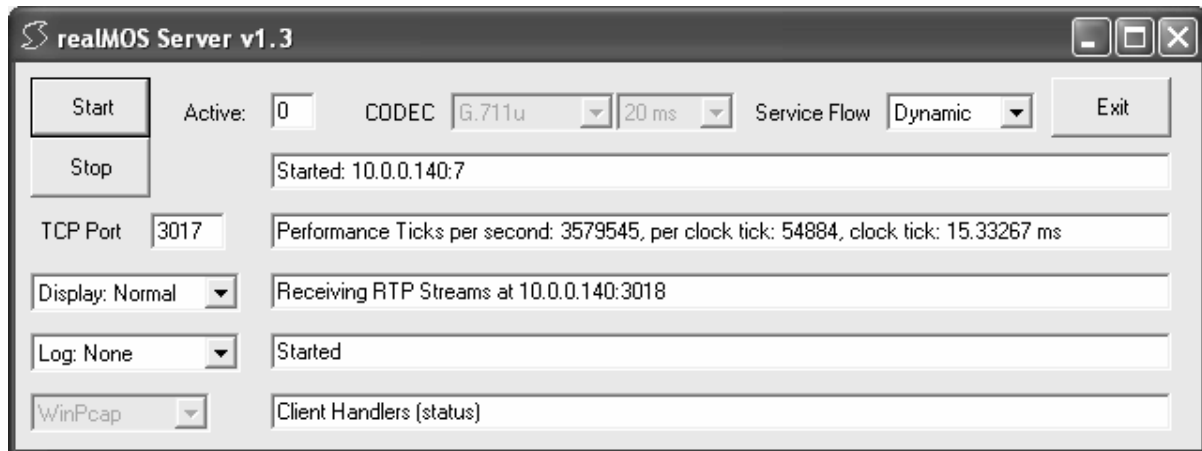
Running realMOS Server

Open the realMOS server program. If you are running a firewall on the Server PC, it may ask you if you want to allow the service or Block the program. You must allow the service (Unblock) to run the realMOS server.



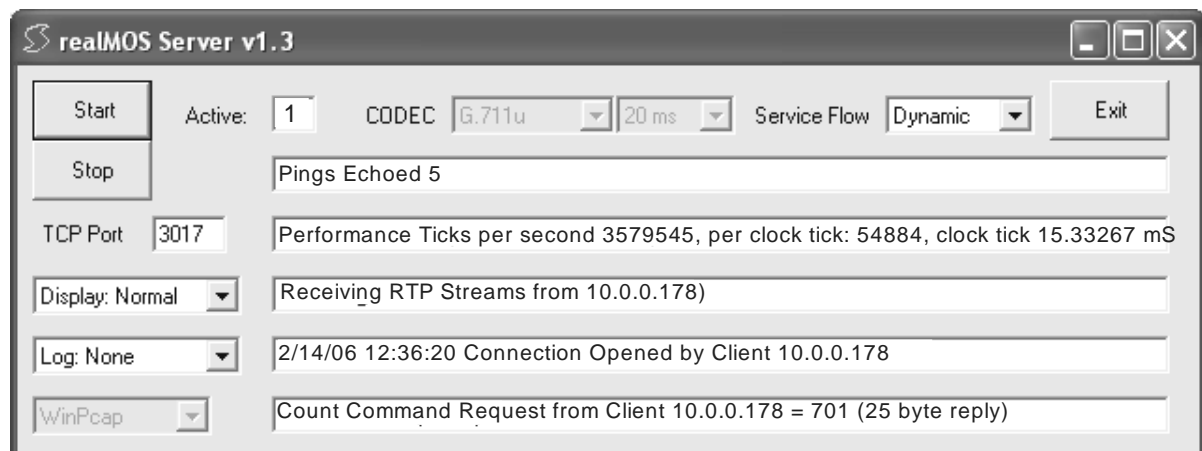
Note: If your PC does not have the program WinPcap installed, you may be prompted to install WinPcap when you attempt to start realMOS. Follow the on-screen instructions to install WinPcap. WinPcap is a networking tool library which enhances the capacity of the server to support multiple users. WinPcap is included in the downloaded files.

1. Select the CODEC type from the pull down menu – G711.u is the most common. (other choices include: G723.1, G726 and G729)
2. Select the Packet Delay – 20 mSec is the most common, other choices include: 10 and 30 mSec. This is the repetition rate of the UGS packets.
3. Select the Service Flow type – typically Dynamic. Dynamic allows the CM to establish a DQoS service flow without special static provisioning. If Static is selected, the VoIP MAC address of each unit must be provisioned and be setup with a static configuration file to setup the QoS service flow.
4. Note the TCP Port Number (3017 in this example). This must be entered in the CM setup “realMOS Server Port”. Also be sure that ports 3017 and 3018 are not blocked by your server, firewall or router between the realMOS server and the public domain.
5. Start the Server (click on START) and note the IP address on the first line (10.0.0.140 in this example).



Note the IP address of the Server, it will also be needed in the CM meter setup. Other RTP and TCP ports may be entered for custom configurations.

Server Display with a Connection



Active Clients

The number of Active Clients indicates the number of current connection to the server. realMOS can support up to 10 simultaneous connection for testing without performance degradation, assuming that the minimum server specifications are met and other programs are not using system resources.

CODEC

The Codec that will be used to encode the digital voice data. Select the codec in use by the network under test.

G.711 is a high bit rate (64 Kbps) ITU standard CODEC. It is the native language of the modern digital telephone network. Using G.711 for VoIP will give the best voice quality; since it uses no compression and it is the same CODEC used by the PSTN network and ISDN lines, it sounds just like using a regular or ISDN phone. It also has the lowest latency (lag) because there is no need for compression, which costs processing time and power.

G.723.1 – There are two different types of G.723.1 compression. One type uses a CELP compression algorithm and has a bit rate 5.3 kbps. The other type uses an MP-MLQ algorithm and provides better quality sound. This type has a bit rate of 6.3 kbps.

G.726 – This CODEC allows for several different bit rates, including 40 kbps, 32 kbps, 24 kbps, and 16 kbps. Most commonly used at 32 kbps.

G.729 – One of the better voice quality CODECs. It converts voice into an 8 kbps stream. It offers toll quality speech at a reasonably low bit rate of 8 Kbps. There are two versions of this CODEC, G.729 and G.729a. G.729a has a more simplified algorithm over G.729, allowing the end phones to have less processing power for the same level of quality.

Packet Delay

The repetition rate of the voice data packets. Typically 10, 20 or 30 mSec. This should be set to match the VoIP implementation being tested.

Display

Select the desired mode for the display from the pull down menu: Display Normal, Display verbose or Display Disabled. This controls the function of the main displays to the right indicating the various server transactions.

Normal will display the key major functions as they occur. Verbose displays every transaction as it occurs. Disabled displays none of the transactions.

RTP Port

The PC's port number used for RTP (real time protocol) data transfer. This is the voice data's protocol.

TCP Port

The PC's port number used for TCP/IP data transfer. TCP is used to transfer information and results data between the CM and the realMOS server.

Logs

Server connection and transaction information may be logged for troubleshooting. Select the desired log, if any.

Active Display

Line 1 – UDP/RTP Activity displays the number of Pings returned (typically 5 per connection).

Line 2 – RTP Stream Status displays the status of the downstream voice data packets that are sent to the CM for Analysis.

Line 3 – Incoming RTP Status shows the upstream RTP packets received from the CM for analysis by the realMOS server.

Line 4 – TCP Connection status indicates the last opened connection time, date and IP address.

Line 5 – Displays the processes of the server as they occur. When a test completes, it indicates the connection is closed, the date and time and the total number of clients that have been served (number of tests) since the server was started.

Exit

Stops the server, exits and closes the program. Settings are not saved and must be re-set the next time the server is started.

PC Server Requirements

- Intel® Pentium® 4 processor 521 (2.8 GHz, 800 MHz FSB, 1M L2 cache)
- 512 Mb (dual channel) shared DDR2 SDRAM at 400 MHz

Sunrise offers a pre-qualified server, which includes the realMOS server software.