XR3000™ Load Test Results

Date: 23 February 2010

Software Version:

Elastix:	1.6-12
DAHDI:	2.2.1
Asterisk[i]:	1.4.29

Test Conditions:

1. Astribank drivers were compiled with an enabled OPTIMIZE_CHANMUTE parameter. As a result, Astribank drivers do not send voice packets for DAHDI performance (echo cancellation, etc.) for channels with no active calls. This option is applied for FXS/FXO channels. The E1/T1 channels are not affected.
2. The Astribank xpp driver was configured for delegation of most work on hardware interrupts to so-called 'tasklets' (parameter rx_tasklet of xpp.ko module).
3. The Flash Operator Panel server was not active.
4. Asterisk was running without the real time priority.
5. All FXS extensions were configured for immediate start. The Asterisk extensions context was defined as follows:

   ```
   [music-test]
       exten => s,1,Answer()
       exten => s,2,Playback(music-8khz-10min)
       exten => s,3,Goto(2)
   ```

   The calls were initiated by analog telephone simulators.
6. For VoIP call tests an additional PCI Ethernet board EN-9230TX-32 (Realtek-based) was used instead of the motherboard's Ethernet interface.
7. Codec used: Open source codec_g729-ast14-gcc4-glibc-pentium4.so
8. I/O ports on Xorcom's FXS (analog-only) models, which support the activation of peripheral devices such as door locks and alarms, do take their toll on the system, and as such are noted here.
9. To be included in the number of maximum simultaneous calls, the voice in the call had to be clear, without interruptions.
10. **Important Note**: **The tests below were not performed for applications such as call centers, conference bridges and predictive dialers. These and other processing-intense applications DO require the more robust processor!!!**

Xorcom USA
23309 North 17th Drive, Suite #100
Phoenix, AZ 85027 USA
Tel: 866-XORCOM1/866-967-2661
info.usa@xorcom.com

www.xorcom.com

Xorcom Ltd.
Misgav Industrial Park, POB 60
D.N. Misgav 20179, Israel
Tel: +972-4-9951999
info@xorcom.com

Test #1: XR3000 with 20 XR0008 devices (32 FXS ports each) connected.

FXS extensions: 640
IO ports 120
Total number of DAHDI channels: 760

Echo Canceller Tail Size (taps[ii])	Maximum Number of Simultaneous Calls	
	CPU: Core 2 Duo E8400 3 GHz RAM: DDR2 1 GB 800 MHz	CPU: Core 2 Quad Q9550 2.83GHz RAM: DDR2 4 GB 800 MHz
256	164	168
128	280	272
64	388	377
32	488	476
Disabled echo canceller	640	640

Test #2: XR3000 with 4 XR0056 devices (4 E1/T1 ports each) connected and G.729 SIP calls.

E1 ports: 16
Total number of DAHDI channels: 480

Echo Canceller Tail Size (taps)	Maximum Number of Simultaneous Calls	
	CPU: Core 2 Duo E8400 3 GHz RAM: DDR2 1 GB 800 MHz	CPU: Core 2 Quad Q9550 2.83GHz RAM: DDR2 4 GB 800 MHz
256	220	260
128	260	360
64	260	420
32	260	420
Disabled echo canceller	280	480

Xorcom USA
23309 North 17th Drive, Suite #100
Phoenix, AZ 85027 USA
Tel: 866-XORCOM1/866-967-2661
info.usa@xorcom.com

www.xorcom.com

Xorcom Ltd.
Misgav Industrial Park, POB 60
D.N. Misgav 20179, Israel
Tel: +972-4-9951999
info@xorcom.com

Test #3: XR3000 with 4 XR0056 devices (4 E1/T1 ports each) connected and G.711a SIP calls.

E1 ports: 16
Total number of DAHDI channels: 480
Additional PCI Ethernet board EN-9230TX-32 (Realtek-based) was used instead of motherboard's Ethernet interface.

Echo Canceller Tail Size (taps)	Maximum Number of Simultaneous Calls	
	CPU: Core 2 Duo E8400 3 GHz RAM: DDR2 1 GB 800 MHz	CPU: Core 2 Quad Q9550 2.83GHz RAM: DDR2 4 GB 800 MHz
256	340	240
128	440	340
64	480	430
32	480	480
Disabled echo canceller	480	480

Test #4: XR3000 SIP calls (G.729 ➔ G.711)

Note: We tested for a maximum of 500 concurrent calls. The actual upper limit is unknown.

Computer Configuration	Maximum Number of Simultaneous VoIP Calls	
	CPU: Core 2 Duo E8400 3 GHz RAM: DDR2 1 GB 800 MHz	CPU: Core 2 Quad Q9550 2.83GHz RAM: DDR2 4 GB 800 MHz
On-board network adapter	350	420
Optional additional 1Gb Ethernet port	380	500

[i] Asterisk is a registered trademark of Digium, Inc. Elastix is a trademark of PaloSanto Solutions. XR2000 and Astribank are trademarks of Xorcom, Ltd. All other trademarks are the property of their respective holders.

[ii] "Taps": The echo cancelling algorithm operates by generating multiple copies of the received signal, each delayed by some small time increment. In digital terms, this is the equivalent of a shift register and each delayed signal appears at its own unique "tap". The number of taps determines the size of the echo delay that can be cancelled. These delayed copies are then scaled (or weighted) and subtracted from the original received signal. (source: Wikipedia)

Xorcom USA
23309 North 17th Drive, Suite #100
Phoenix, AZ 85027 USA
Tel: 866-XORCOM1/866-967-2661
info.usa@xorcom.com

www.xorcom.com

Xorcom Ltd.
Misgav Industrial Park, POB 60
D.N. Misgav 20179, Israel
Tel: +972-4-9951999
info@xorcom.com