

XR2000/XE2000 Load Test Results

Date: 02 June 2012

Software Version:

Elastix: 2.2
DAHDI: 2.5.0.2.svn.r10584-1
Asterisk!: 1.8.9.1

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 Flash Operator Panel server was not active.
3. Asterisk was running without the real time priority.
4. 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.

5. Used G.729 codec: Open source codec_g729-ast18-gcc4-glibc-pentium4.so
6. To be included in the number of maximum simultaneous calls, the voice in the call had to be clear, without interruptions during 10 minutes. Astribank drivers should not report about any USB communication problem during the 10 minutes test.
7. OSLEC and MG2 software echo canceller were used. The tests were performed also when the echo canceller is disabled at all. This simulates the situation when the hardware-based echo canceller is used.

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8. The following servers were tested:

CPU	Mother board	RAM	HDD
Intel Atom D525, 1.8GHz	Intel D525MW	1GB, DDR3	SATA, 7200 rpm

The Hyper-threading option was disabled in BIOS. According to our tests this improves the results for about 8% when DAHDI channels are used. For G.729->G.711 calls, the Hyper-threading improves the performance for about 60% (refer to the results of test #3).

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 hardware!!!

Test #1:

XR2000/XE2000 with 2 and 3 XR0008 devices (32 FXS ports each) connected

FXS extensions: 64 and 96
 I/O ports 12 and 18
 Total number of DAHDI channels: 76 and 114

Echo Canceller Tail Size (taps ⁱⁱ)	Maximum Number of Concurrent Calls	
	2x XR0008	3x XR0008
256	19	16
128	37	30
MG2, 128	41	32
Disabled echo canceller	64	96

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Test #2:***XR2000/XE2000 with 1 E1 port and G.729 SIP calls***

E1 ports: 1
 Total number of DAHDI channels: 30

Echo Canceller Tail Size (taps ⁱⁱ)	Maximum Number of Concurrent Calls	
	G.729	G.711
256	26	27
128	30	30
MG2, 128	30	30
Disabled echo canceller	30	30

Test #3:***XR2000/XE2000 SIP calls with and without G.729/G.711 transcoding***

Codec	Maximum Number of Concurrent Calls
G.711a -> G.711a	432
G.729 -> G.711a, hyper-threading enabled	138
G.729 -> G.711a, hyper-threading disabled	84

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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)