ERICSSON

Internal Information
System Test Record

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STR-MAS Capacity

Content

History

Version	Date	History
A	2007-09-23	MoIP 6.0
B	2007-11-16	MoIP 6.0 FD2

1 Introduction

These tests were performed to find out the voice traffic capacity of MAS in the 6.0 FD2 release of MoIP on the Niagara T2000 hardware. The same test methods as described in STS-MAS Capacity were used.

2 Test Summary

The tests showed that the R5A.003 MAS on a Niagara T2000 can handle 304 channels of voice traffic generated according to the Mobeon Traffic Model.

3 Test Result

The test results from the executed test cases are presented in the table below.

Test Case	Amount of channels one MAS can handle
3.1.1	304 channels
3.1.2	Not executed due to lack of time
3.1.3	Not executed due to lack of time

4 Extended Test Results

At the measured capacity (304 channels) was less than 50% of the CPU capacity used and no other hardware (or OS) bottle necks were observed. It can therefore be assumed that an optimization of the MAS code could improve the capacity with up to 100%.

5 Trouble Report Summary

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6 Test Results and Evaluation

6.1 Test Case 3.1.1

MAS_Capacity_repor
t_TC_3.1.1_304ch.xl

The test results can be found in the attached Excel document. The tests were performed as specified in STS-MAS Capacity. The main part of the traffic was generated by SIPp. All messages in the system where AMR coded, 12.2kbit/s. There was no G.711 coded messages at all. Two slam down, two deposit and two retrieval channels were generated by Hammer to measure the signaling and greeting delays. Since the delays were measured by Hammer is the time spent by MTG-C included in the measured delays and the delay requirements were modified to:

- For deposit sessions shall the average ss7+MAS greeting prompt delay plus the standard deviation be less than 1200 ms.
- For retrieve sessions shall less than 5% of the ss7+MAS greeting prompt delays be longer than 2000 ms.

The capacity was measured at the traffic levels: 304 channels. The measured delays and CPU usage were ok. If the number of channels where increased to 330 MAS did have problems with both connecting and disconnecting calls. The signaling delays went up and MAS had problems with clearing calls when SIPp disconnected. The session lengths went up for a lot of calls and traffic was no longer according to the traffic model. (Deposit sessions were found where the session length was 50 seconds but the deposited mail was only 7-8 seconds.) It is hard to tell why this happens since no errors is written in the log. A couple of attempts were made to run ~330 channels and the same behavior was seen every time.

So, the level where MAS fulfills the capacity requirements and runs stable (for at least two hours) is about 300 channels.

Other Information and Risks

This paragraph is intentionally left blank.

7 Test Configuration

7.1 HW and SW

The tests were performed in the stlab. The DNS entry murhost was load balanced, via BigIP, on two multimaster MURs. The HW and SW versions are shown in the following tables.

Table 1 HW for MAS, MS and MUR

Component	Instance	Type	CPU [MHz]	Mem [MB]
MAS	-	Niagara T2000	16 x 1000	8184
MUR	multimaster	Fire V240	1 x 1336	4096
MUR	multimaster	Fire V240	1 x 1336	4096
MS NTF	-	Fire V240 + 2xEMC	2 x 1003	4096
MS NTF	-	Fire V240 + 2xEMC	2 x 1003	4096
SSP	-	Fire V210	2 x 1503	4096

Table 2 SW versions

Component	Version	Patches
MAS	R5A.003	-
VVA	R3B.004	-
MUR	R11D.013	-
MS	P12E.005	-
NTF	R13B.002	-
Deployment Server	R7C.005	-
SSP	R2A.003	-
MGW	R2B	-

Component	Version	Patches
PGW	R2B	-

7.2 Test Tools

The main part of the voice traffic was generated with SIPp directly towards MAS. Hammer was used to measure the ss7 greeting and signaling delays. The greeting prompt delays were measured on two channels running slam down sessions, two channels running retrieve sessions and two sessions running deposit sessions. MVASsim was running five channels to measure the IMAP greeting prompt delay and the LDAP signaling delay.

7.3 Traffic generation

7.3.1 Test Case 3.1.1

Only voice mail traffic was generated during these tests. No early slam downs or voice SMS were generated. The traffic intensity was calculated as follows. All calculations below are done for 100 000 users. All figures are taken from the Traffic Model ref. [1].

Deposit
There is a total of 4 000 voice messages/hour that should be deposited via TUI.
1 message is deposited per session.
The number of deposit sessions/hour are 4 000.
Each deposit takes 22s.
(7s greeting+15s message=22s)
The traffic intensity is 4 000*22/3600= 24 channels.
The percentage of total TUI sessions = 31%

Retrieval
There is a total of 4 000 messages/hour that should be read via TUI.
During each retrieval session 1 message is read.
The number of retrieve sessions/hour is 4 000.
Each retrieve session takes 29s.
(7s greeting+7s retr+15s voice=29s)
The traffic intensity is 4 000*29/3600= 32 channels.
The percentage of total TUI sessions = 31%

Slam down
There is a total of 5 000 slam downs/hour.
Each slam down takes 7s.
(7s holding time)
The number of slam down sessions/hour is 5 000.
The traffic intensity is 5000*7/3600=10 channels.
The percentage of total TUI sessions = 38%

The total TUI traffic intensity is 66 channels.

When the number of channels one MAS can handle has been measured is the number of users that one MAS can handle calculated as:

No. of users=no. of channels*100 000/66

7.4 Test Data

MAS was installed with high water mark set to 300 channels (heap spaces were calculated by installation program). Tuning was made according to MAS-IG (rlim_fd_max=16384 and ip:dohwcksum=0). There were about 400 000 users in MUR during the test. Traffic was generated towards 360 000 users on four MS instances in a two node cluster. Traffic generation and lab configuration were according to the Traffic Model [1] and STS-MAS Capacity [2] with the following exceptions:

- No voice SMS traffic was generated
- No early slam downs were generated.

The ss7 greeting prompt delays were measured by the Hammer scripts on two slamdown channels, two deposit channels and two retrieve channels. The ss7 signaling delays were taken from the Hammer channel detail reports for two slamdown channels, two deposit channels and two retrieve channels. The LDAP delays were measured by TIMEMEASURE1 in the MVASsim scripts and the IMAP greeting prompt delays were measured by TIMEMEASURE2 in the Slamdown and Deposit MVASsim scripts (see MVASsim scripts in the following sections).

7.4.1 CoSes in ldif format


CoS_file.log

7.4.2 Hammer scripts


Hammer_scripts.tar

7.4.3 MVASsim traffic scripts


MVASsim_scripts.tar

8 References

[1] Traffic Models for MoIP
6/1551-HDB 101 02 Uen

[2] STS – MAS Capacity
1/STS-MAS 0001

9 Terminology

CoS	Class of Service