

SONG: Enemy Territory Network Traffic Trace Files

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Abstract- This technical report describes the conditions under which network traffic was generated and captured for a range of traffic traces available on the SONG database. In this case the traffic traces concern network traffic generated by the Enemy Territory game running on a central server with between two and nine players and two different maps. This dataset is made publicly available as part of the SONG database project of the Smart Internet CRC (<http://caia.swin.edu.au/sitcrc/song>) to assist researchers in accessing databases of network game traffic generated under known conditions. This report and the SONG website should be referenced in any work which uses any of the corresponding dump files.

Keywords- Traffic trace, Smart Internet CRC

I. INTRODUCTION

SONG (Simulating Online Network Games) is a sub-project of the Smart Networks Stream 4, itself a project of the Smart Internet CRC. More information the CRC and the Smart Networks Projects can be found here [1, 2]. The goal of this project is to develop a publicly available library of network traffic traces and simulation models that can be used to augment existing IP network engineering tools and to demonstrate any new models developed to assist in the design of networks to carry game traffic.

This document describes the conditions under which the corresponding network traces were both generated and captures. This information should be considered when analysing any statistical results generated from the trace file as well as when comparing the properties of data from two different trace files.

II. TRAFFIC CAPTURE SCENARIO

This report deals with traffic captured during networked sessions of the Enemy Territory game [3]. The report is relevant to numerous trace files available

on the SONG website and describes the game scenarios, number of players and network configuration under which the trace files were captured.

A. Game Details

Enemy Territory is a client-server based game with client software running on standard PCs. Player actions are transmitted from the client to the server. The server constructs a game state for distribution to all players based on these actions. The game state is then distributed to all players. The game state may be different for players to limit the possibility of cheating, particularly wall-hacks.

For all trace files described in this report the game was played across a switched Ethernet LAN.

B. Server configuration

The server configuration for this series of trials is described in the following table.

Table 1. Server configuration

IP address	136.186.229.146
CPU	Intel Celeron 2.8GHz (8kb L1 cache, 128kb L2 cache)
RAM	1GB PC3200 DDR RAM (2 x 512MB in dual channel configuration)
Motherboard	ASUS P4-P800VM
Onboard NIC	Intel 82801BA (D865) Pro/100 VE
Onboard Video	Intel 82865G (865G GMCH) SVGA controller (reported by FreeBSD dmesg)
HDD	Seagate ST380011A/8.01 80GB PATA UDMA100
OS	FreeBSD 5.4-RELEASE

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Swinburne University of Technology (<http://caia.swin.edu.au>)

OS KERNEL CONFIG	Kernel config file: GENERIC+ALTQ Commented the line: cpu I486_CPU Commented the line: cpu I586_CPU Added the line: options ALTQ Added the line: options ALTQ_CBQ Added the line: options ALTQ_PRIQ Added the line: options ALTQ_HFSC
OS CONFIG PARAMETERS	Relevant sysctl variable/value pairs: kern.clockrate = { hz = 1000, tick = 1000, profhz = 1024, stathz = 128 }
RELEVANT ENEMY TERRITORY CONFIG PARAMETERS	set dedicated "1" set sv_maxclients "20" set sv_maxRate "200000" set sv_dl_maxRate "200000" set sv_allowDownload "1" set g_antilag "1"

Main->Options->Game->Log Messages	Important	Yes
Main->Options->Game->Auto-Action		None
Main->Options->Game->Use JPEG For Autoscreenshots		Yes
Main->Options->Game->Show Tool Tips		Yes
Main->Options->View->Draw Gun		Yes
Main->Options->View->Show Compass		Yes
Main->Options->View->Mission Timer		On
Main->Options->View->Reinforcement Timer		On
Main->Options->View->Cursor Hints		Size Pulse
Main->Options->View->Ejecting Brass		Very High
Main->Options->View->Low Quality Sky		No
Main->Options->View->Corona Distance		Normal
Main->Options->View->Particles		Yes
Main->Options->View->Wall Mark Lifetime		Normal
Main->Options->View->Blood Flash		Full
Main->Options->View->Blood Splatter		Full
Main->Options->System->Sound Quality		22kHz (High)
Main->Options->System->Color Depth		32 bit
Main->Options->System->Fullscreen		Yes
Main->Options->System->Geometric Details		High
Main->Options->System->Texture Detail		High
Main->Options->System->Texture Quality		32 bit
Main->Options->System->Texture Filter		Bilinear
Main->Options->System->Detail Textures		Yes
Main->Options->System->Depth Buffer		24 bit
Main->Options->System->Compress Textures		Yes
Main->Options->System->Sync Every Frame		No
Main->Options->System->Dynamic Lights		Enabled (single pass)
Main->Options->System->GL Extensions		Enabled
Main->Options->System->Connection		LAN
Main->ET Pro->Config->Text Color Filter		Blank
Main->ET Pro->Config->Muzzle Flash		Yes
Main->ET Pro->Config->Gibs		Yes
Main->ET Pro->Config->Bullet Tracers		Yes
Main->ET Pro->Config->Log Banners		Yes
Main->ET Pro->Config->Anti-Lag		Yes, ET Pro Antilag
Main->ET Pro->Config->sv_cvar Backups		Yes
Main->ET Pro->Config->Optimized Prediction		Yes
Main->ET Pro->Config->Simple Items		No
Main->ET Pro->Config->Hit Sounds		Yes
Main->ET Pro->Config->Chat Sounds		No
Main->ET Pro->Config->Shove Sounds		Yes

C. Client configuration

There were nine different client machines involved in the trials. Each trial used between two and nine clients. The IP addresses of the clients and the client machine configuration (hardware and operating system) and Enemy Territory configuration is described in each table

The last entry in the table defines the Enemy Territory in game resolution used by the client. This differed between clients. However, the following Enemy Territory configuration was common to all clients

Table 2. Enemy Territory common configuration

Main->Options->Game->Always Run	Yes
Main->Options->Game->Double-Tap Prone	Yes
Main->Options->Game->Automatic Reload	Yes
Main->Options->Game->Autoswitch	Yes
Main->Options->Game->Weapon Icon Flash	Yes
Main->Options->Game->Use Weapon Cycle For Zoom	On
Main->Options->Game->Default Zoom Level	All the way out
Main->Options->Game->Zoom Levels	8 levels of zoom
Main->Options->Game->Quick Chat Mode	Numeric
Main->Options->Game->Chat Icon Time	Normal
Main->Options->Game->Check For Updates On Startup	Yes
Main->Options->Game->Get Missing Files From Server	Yes
Main->Options->Game->Use HTTP/FTP Downloads	Yes
Main->Options->Game->Complaint Pop-Up	On

Main->ET Pro->Config->Goat Sound	Yes
Main->ET Pro->Config->Announcer	Yes
Main->ET Pro->Config->'weapalt' Reloads	Yes
Main->ET Pro->Config->L4 Soldier SMG Weapon Bank	2
Main->ET Pro->HUD->Alternative HUD	Normal HUD
Main->ET Pro->HUD->HUD Settings	Normal
Main->ET Pro->HUD->Fireteam Opacity	1.00
Main->ET Pro->HUD->Lagometer Opacity	1.00
Main->ET Pro->HUD->Watermark Opacity	1.00
Main->ET Pro->HUD->Chat Background Opacity	0.33
Main->ET Pro->HUD->Spectator Status Opacity	1.00
Main->ET Pro->HUD->Chat Flags	Yes
Main->ET Pro->HUD->Spectator Team Flags	No
Main->ET Pro->HUD->Local Time	No
Main->ET Pro->HUD->Ranks	Yes
Main->ET Pro->HUD->Draw 2D	Yes
Main->ET Pro->HUD->Pop-Up Promotions	Yes
Main->ET Pro->HUD->Pop-Up Skill Rewards	Yes
Main->ET Pro->HUD->FPS Counter	No
Main->ET Pro->HUD->Lagometer	No
Main->ET Pro->HUD->Draw Movement Speed	No
Main->ET Pro->HUD->Speed Units	UPS
Main->ET Pro->HUD->Speedometer Refresh Rate	100.00

Table 3. Client 1 configuration

IP address	136.186.229.70
CPU	Intel Celeron 2.4GHz (8kb L1 cache, 128kb L2 cache)
RAM	512MB DDR RAM (2 x 256MB in dual channel configuration)
Motherboard	ASUS P4-P800VM
Onboard NIC	Intel 82801BA (D865) Pro/100 VE
Onboard Video	Sparkle Nvidia GeForce 6600 256MB AGP 8x graphics card (BIOS revision 5.43.02.46T5DH)
HDD	Western Digital WD400JB 40GB PATA UDMA100
OS	MS Windows XP Professional SP2 + all critical security patches as at 09/01/2006
Other	NVIDIA DRIVER: 81.98_forceware_winxp2k_english_whql.exe
Resolution	800x600

Table 4. Client 2 configuration

IP address	136.186.229.71
CPU	Intel Celeron 2.8GHz (8kb L1 cache, 128kb L2 cache)
RAM	1GB DDR RAM (2 x 512MB in dual channel configuration)
Motherboard	ASUS P4-P800VM
Onboard NIC	Intel 82801BA (D865) Pro/100 VE
Onboard Video	Sparkle Nvidia GeForce 6600 256MB AGP 8x graphics card (BIOS revision 5.43.02.46T5DH)
HDD	Seagate ST380011A/8.01 80GB PATA UDMA100
OS	MS Windows XP Professional SP2 + all critical security patches as at 09/01/2006
Other	NVIDIA DRIVER: 81.98_forceware_winxp2k_english_whql.exe
Resolution	1024 x 768

Table 5. Client 3 configuration

IP address	136.186.229.72
Specs same as 136.186.229.71	
Resolution	1024x768

Table 6. Client 4 configuration

IP address	136.186.229.73
Specs same as 136.186.229.71 except for NVIDIA driver version. 78.01_winxp2k_english_whql.exe	
Resolution	800x600

Table 7. Client 5 configuration

IP address	136.186.229.74
Specs same as 136.186.229.71 except for NVIDIA driver version. 7.1.8.9 (from device manager -> display adapter -> driver tab)	
Resolution	800x600

Table 8. Client 6 configuration

IP address	136.186.229.75
Specs same as 136.186.229.71	
Resolution	1024x768

Table 9. Client 7 configuration

IP address	136.186.229.92
CPU	Intel P4 3.0GHz
RAM	512MB DDR RAM (1x512MB)
Motherboard	Gigabyte GA81865 GM-775
Onboard NIC	Marvel Yukon Gigabit Ethernet 10/100/1000

IP address	136.186.229.92
Onboard Video	Sparkle Nvidia GeForce 6600 256MB AGP 8x graphics card (BIOS revision 5.43.02.46T5DH)
HDD	Seagate ST380817AS 80GB SATA150
OS	MS Windows XP Professional SP2 + all critical security patches as at 09/01/2006
Other	NVIDIA DRIVER: 7.7.7.7
Resolution	1280x1024

Table 10. Client 8 configuration

IP address	136.186.229.126
CPU	Intel Celeron 2.4GHz (8kb L1 cache, 128kb L2 cache)
RAM	1.25 GB DDR RAM
Motherboard	ASUS P4-P800VM
Onboard NIC	Intel 82801BA (D865) Pro/100 VE
Onboard Video	Sparkle Nvidia GeForce 6600 256MB AGP 8x graphics card (BIOS revision 5.43.02.46T5DH)
HDD	Western Digital WD400JB 40GB PATA UDMA100
OS	MS Windows XP Professional SP2 + all critical security patches as at 22/06/2005
Other	NVIDIA DRIVER: 7.1.8.4 (from device manager -> display adapter -> driver tab)
Resolution	800x600

Table 11. Client 9 configuration

IP address	136.186.229.138
CPU	Intel Celeron 2.4GHz (8kb L1 cache, 128kb L2 cache)
RAM	512 MB DDR RAM (2 x 256MB in dual channel)
Motherboard	ASUS P4-P800VM
Onboard NIC	Intel 82801BA (D865) Pro/100 VE
Onboard Video	Sparkle Nvidia GeForce 6600 256MB AGP 8x graphics card (BIOS revision 5.43.02.46T5DH)
HDD	Western Digital WD400JB 40GB PATA UDMA100
OS	FreeBSD 5.4 Release
Other	NVIDIA DRIVER: 1.0-7174 (from sysctl hw.nvidia.version) "sysctl kern.clockrate" = "kern.clockrate: { hz = 100, tick = 10000, profhz = 1024, stathz = 128 }"
Resolution	800x600

All Windows and FreeBSD Enemy Territory client software was patched to ET version 2.60 and ETPro version 3.2.4.

Teams never differed in numbers of players by more than one i.e. even numbers of players were equally

divided between both teams, odd numbers of players were split such that one team had one extra player.

D. Network configuration

The Enemy Territory clients were attached to the central server via the CAIA LAN running at 100 Mbps. The traffic capturing was done on a bridge machine sitting between the Enemy Territory dedicated server and the CAIA LAN. The traffic was captured using **tcpdump** [4] to obtain a raw packet trace of all LAN traffic during each experiment.

The accuracy of the timestamps generated by tcpdump on the traffic capturing machine is documented in [5].

III. NETWORK TRACES

This section describes the different Enemy Territory traffic traces that are available on the SONG database. All traces can be found under the hierarchy **SONG – traffic traces – Enemy Territory**. The naming convention used for the tcpdump files described in this report is as follows:

```
etpro_<trialdate>_<run#>_<mapname>_<numplayers>.dmp
etpro_<trialdate>_<run#>_<mapname>_<numplayers>_fragment.dmp.
```

The naming convention used for the Enemy Territory log files described in this report is as follows:

```
<configfilename>-<date>_<time>_<pid>_<udpport>.log.
```

Traffic was captured using the following configuration:

- **tcpdump** has been configured to capture the first 100 bytes of each packet. This 100 bytes is made up of:
 - 14 bytes – Ethernet frame header
 - 20 bytes – IP header
 - 8 bytes – UDP header
 - 58 bytes – first part of the UDP payload

The data collected has not been anonymised.

The tcpdump files that end in extension “_fragment.dmp” are for general consumption and are provided as a cut down sample of the full tcpdump files. The fragment files contain only packet header information for 5000*number_of_participating_clients packets. The packets are obtained from an offset of 10000 packets into the original full trace to ensure only active game traffic makes up the sample.

For example, the sample file for the etpro_190106_1_fuedump_9.dmp full trace is named etpro_190106_1_fuedump_9_fragment.dmp and contains 9*5000 = 45000 packet headers, for the packets numbered 10000 to 54999 (inclusive) in the full trace file.

A. Game Trials

Table 12. Trial 1

Number of clients	2
Full Tcpdump file	etpro_180106_1_fueldump_2.dmp
Full Tcpdump MD5	5e1b49c4ff7a9f417f74c1b87c7c6635
Sample Tcpdump file	etpro_180106_1_fueldump_2_fragment.dmp
Sample Tcpdump MD5	c3f40da89fb0bc9dacb14ffe722a0a5d
Log file	trials-180106_1524_52074_27960.log

Table 13. Trial 2

Number of clients	3
Full Tcpdump file	etpro_180106_1_fueldump_3.dmp
Full Tcpdump MD5	9221f00c3e5493ab4d1099afd4b71ee3
Sample Tcpdump file	etpro_180106_1_fueldump_3_fragment.dmp
Sample Tcpdump MD5	a7272dd727e3eb18ff2025a914e5bd96
Log file	trials-180106_1557_52230_27960.log

Table 14. Trial 3

Number of clients	4
Full Tcpdump file	etpro_180106_1_fueldump_4.dmp
Full Tcpdump MD5	a2337da4f439548c2f131f77858b4be0
Sample Tcpdump file	etpro_180106_1_fueldump_4_fragment.dmp
Sample Tcpdump MD5	fa762cf60a40a62414411465ef30196e
Log file	trials-180106_1659_52452_27960.log

Table 15. Trial 4

Number of clients	5
Full Tcpdump file	etpro_190106_1_fueldump_5.dmp
Full Tcpdump MD5	c28a02336ea206269f34bcbf8c8b9973
Sample Tcpdump file	etpro_190106_1_fueldump_5_fragment.dmp
Sample Tcpdump MD5	f1e0ada64b4086b6a5f4156bafed9dba
Log file	trials-190106_1500_55488_27960.log

Table 16. Trial 5

Number of clients	6
Full Tcpdump file	etpro_190106_1_fueldump_6.dmp
Full Tcpdump MD5	86bc5671254ad4feb9c84448ee204ff0
Sample Tcpdump file	etpro_190106_1_fueldump_6_fragment.dmp
Sample Tcpdump MD5	a95deb4d3719062b96cf2fd0e25800dd
Log file	trials-190106_1526_55579_27960.log

Table 17. Trial 6

Number of clients	7
Full Tcpdump file	etpro_190106_1_fueldump_7.dmp
Full Tcpdump MD5	a2633f5eb62dfb2b3520e6247ef88520
Sample Tcpdump file	etpro_190106_1_fueldump_7_fragment.dmp
Sample Tcpdump MD5	72b48ddc622b73c12f71956a7b528042
Log file	trials-190106_1608_55712_27960.log

Table 18. Trial 7

Number of clients	8
Full Tcpdump file	etpro_190106_1_fueldump_8.dmp
Full Tcpdump MD5	cf5dbef5da5c645fb574278c768e0b76
Sample Tcpdump file	etpro_190106_1_fueldump_8_fragment.dmp
Sample Tcpdump MD5	3d7064f328f6d4870a521fcb860f8db2
Log file	trials-190106_1637_55820_27960.log

Table 19. Trial 8

Number of clients	9
Full Tcpdump file	etpro_190106_1_fueldump_9.dmp
Full Tcpdump MD5	55d88ddd75c9e6c8afb29a4c03ee501
Sample Tcpdump file	etpro_190106_1_fueldump_9_fragment.dmp
Sample Tcpdump MD5	f136bc8792068f14769adcc335f39c16
Log file	trials-190106_1712_56031_27960.log

Table 20. Trial 9

Number of clients	6
Full Tcpdump file	etpro_190106_1_oasis_6.dmp
Full Tcpdump MD5	c0399a1430d4feb346bbfb750db4053a
Sample Tcpdump file	etpro_190106_1_oasis_6_fragment.dmp
Sample Tcpdump MD5	67231b7dea21dd4a0e24e367a4db79de
Log file	trials-190106_1811_56291_27960.log

Table 21. Trial 10

Number of clients	5
Full Tcpdump file	etpro_010206_1_oasis_5.dmp
Full Tcpdump MD5	5ad8de41138b1c89a259966ebe2a2b14
Sample Tcpdump file	etpro_010206_1_oasis_5_fragment.dmp
Sample Tcpdump MD5	7ab4408cfe74f4b60795fd42cbd18f82
Log file	trials-010206_1820_40757_27960.log

HOW TO CITE

This section provides examples of how to cite any tracefiles or their related technical reports obtained from the online SONG database.

L. Stewart, P. Branch, "HLCS, Map: dedust, 5 players, 13Jan2006", Centre for Advanced Internet Architectures SONG Database, <http://caia.swin.edu.au/sitcrc>, hlcs_130106_1_dedust_5_fragment.tar.gz, April 4th, 2006.

L. Stewart, P. Branch, "Quake3, Map: caialab3, 8 players, 10Jan2006", Centre for Advanced Internet Architectures SONG Database, <http://caia.swin.edu.au/sitcrc>, quake3_100106_1_caialab3_8_fragment.tar.gz, April 4th, 2006.

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- [3] "Wolfenstein", 2006, <http://games.activision.com/games/wolfenstein/>
- [4] "TCPDump/libpcap", 2006, <http://www.tcpdump.org>
- [5] L. Stewart, "Evaluation of the CAIA GENIUS Bridge's Timestamping Accuracy", CAIA Technical Report 060413A, April 2006, <http://caia.swin.edu.au/reports/060413A/CAIA-TR-060413A.pdf>