Tutorial Enum-Bench-Tool

Student: Hiago Araujo Silva

Leader: Prof. Dr. Paulo Roberto Guardieiro

Federal University of Uberlândia

Scientific Initiation Project

May 19, 2014

Contents

1 Introduction

EnumBenchTool is a tool for test management benchmarking software DNS / ENUM developed by the Laboratory of Computer Networks Federal University of Uberlandia . This tool was developed in Python aiming to automate, standardize and validate the tests, and also make easy to get the results. The EnumBenchTool is in early stage of development and currently offers supports to the following softwares: BIND, MyDNS-NG, NSD and PowerDNS. It is important that in the current stage, the EnumBenchTool is not responsible for testing benchmarking itself. In fact, the EnumBenchTool is an manipulative package of others existing tools, facilitating the management of benchmarking tests to make the process of configuration, synchronization and transparent validation for user.

2 Component Tool

The following is a brief description of each of these tools managed by EnumBenchTool.

It is recommended for the installation of all tools, which are used by EnumBenchTool cited below, download the full package of the tool directly from the vendor site to prevent missing plugins needed.

2.1 Operating System

For all client , master and server modules there is the option of Linux as operating system and versions:

- ubuntu-desktop 12.04 LTS

  Download: http://www.ubuntu.com/server

- ubuntu-server 12.04 LTS

  Download: http://www.ubuntu.com/desktop.

* All modules can optionally run on desktop or server version of ubuntu is up to the user.

2.2 prerequisite

To begin installing the tools that are used by the EnumBenchTool and even EnumBench-Tool , some libraries and plugins should be installed. Below is the list of dependencies that are subject to version changes because the OS version or own premises.

- gcc
- python-numpy
- python-mysqldb

2.3 BIND

One of the software DNS / ENUM used in the laboratory test is the BIND software, belonging the company Internet Systems Consortium (ISC).

Prerequisite: For installation of BIND is necessary that the system has in its libraries the C language installed correctly.

2.3.1 Installation

Download: *ftp://ftp.isc.org/isc/bind9/* PS: recomended version : 9.8.1-P1

- unzip the file
- Inside the unzipped file directory run the commands below:

  » sudo sh configure

  » make

  » sudo make install

PS: It is recommended to install bind before other tools.
To test if the bind was correctly installed, in the console type the command to verify the installed version:
» named -v
expected result: » BIND 9.8.1-P1

2.4 DNSPERF

To conduct performance testing is necessary to emulate the traffic consulting clients DNS / ENUM server. The traffic generator chosen is the tool DNSPERF. This tool is a software developed by Nominum, widely used for performance analysis of authoritative DNS servers. this tool can emulate multiple clients simultaneously in a single process.

2.4.1 Installation

Download: ftp://ftp.nominum.com/pub/nominum/dnsperf/

- recomended version : 1.0.1.0 .

PS : Attention to errors that may occur during the installation, there may be some conflict of systems already installed.

To test if the DNSPERF was correctly installed, type the console command: »dnsperf
If all goes well, the tool will start and show message first.

- *»DNS Performance Testing Tool*
  »Nominum Version 1.0.1.0

2.5 BWM-NG

The bwm-ng tool offers the user the possibility of monitoring traffic data that passes through a given Ethernet port. The EnumBenchTool uses bwm-ng to monitor the communication link used for sending queries and replies.

2.5.1 Instalação

Download: http://www.gropp.org/

- Unzip the file
- Inside the unzipped file directory run the commands below:

  » sudo sh configure

  » make

  » sudo make install

To test if the tool has been successfully installed, enter the command:

» bwm-ng

And get a screen with information on the console of the tool and its version, with the first lines something like:

bwm-ng v0.6 (probing every 0.500x), press 'h' for help

input: /proc/net/dev type: rate

(table with more results)

3 Operation

3.1 Installing EnumBenchTool

The Enum-Bench-Tool has some initial parameters to be set. When you unzip the file containing all the modules of this tool organized with the following architecture of directories:

```
Enum-Bench-Tool
├── src
├── config
└── setup.sh
```

To better use the tool during testing, it is recommended NOT to install, configure and run the EnumBenchTool using mode “sudo” or ” root”.

3.2 Configuration EnumBenchTool

To install the tool run scritp 'setup.sh' that is inside the package directory setup tool, which will create a directory folder on the 'home' with the tool modules and other configuration parameters.
For such action run the following command:

»*./setup.sh*

To perform the confirmation that this procedure was successful, just check the home directory if a directory with the name 'enum-bench-tool' containing a folder for each DNS / ENUM software (bind, nsd, pdns , MyDNS-NG), an 'SRC' directory and a 'CONFIG' directory. When you open the directory enum-bench-tool must contain the following content:

```
Enum-Bench-Tool
├── src
├── config
├── bind
├── nsd
├── pdns
└── MyDNS-NG
```

3.2.1 “Session-Setup.dat” - Configuration file

The session-setup.dat configuration file is responsible for providing the tool during its execution all the configuration and execution necessary parameters, refering to the addresses of directories, IP as the tools.

File location : /enum-bench-tool/session-setup.dat

Has in the content of the file the following items separated by sessions:

Session description	
save_dir	address of the directory where the results are saved. Example: *: /home/<user>/enum-bench-tool/bench-results/*
session_name	Name of the test session to be held
scenario_list	number of scenarios to be simulated
update_enable	enable or disable updates, possible responses ('yes' ou 'no')
update_rate	refresh rate with unit = ups (Ex: 1ups (update per second)).
Clients	
clients	Amount and form of customers that will be used EX: 2:2:4 means for consulting 2 registers each time, selecting 2 by 2 and them by 4 available clients, and accepts integer values of the type " 1, 2, 3,."
num_dnsperf_processes	Number of setted process for the tool.
repetitions	number of repetitions
query_type	what kind of record will be consulted as: authoritative and non-authoritative
software	What software will be used in this session bind, pdns, MyDNS ou nsd
processes	Name of the process performed by a tool EX: The bind software to be executed appears in the process list as named
processes_users	To whom the process belongs.
num_of_cpu	number of CPUs you want to use the test.
Address	
server_ip_qry	IP address of the server.
server_ip_ctrl	IP address of the server to control.
client_ip_ctrl	IP address of the client.

Records	
num_of_zones	number of zones to be created
domain_name	domain records (Ex: e164.arpa)
num_of_naptr	amount of NAPTR records
time	
limit	timeout attempts, units = seconds.
timeout	standby time of inactive connection.
create_q_files	option to 'yes' or 'no' to create the query files or
use existing ones.	
zone files options	
create_zones	'yes' or 'no' option to allow the tool to create zones
restart_software	'yes' or 'no' option to allow the tool to reset the dns software
MySQL config	
create_database	'yes' or 'no' option to create the database
mysql_database	name of the database (default: tool name)
mysql_user	User Database.
mysql_user_pass	password database.
users and passwords	
server_pass	Password corresponding to the user's server.

In the next item is an example of the configuration file filled with parameters already used in testing to facilitate.

3.2.2 Exemplo de arquivo session-setup.dat

```
# Setup configuration file

# Session description
save_dir                /home/harrypoter/bench-results/
session_name            test
scenario_list           500

update_enabled      no
update_rate         1ups

# clients
clients                         2:2:4, 10, 15:5:30
num_dnsperf_processes       5
repetitions                     1
query_type              qry-autho-exist qry-autho-non-exist qry-non-autho-non-exist

software                bind
processes               named
processes_users         bind
num_of_cpu              24

# Address
server_ip_qry               10.27.0.24
server_ip_ctrl              10.27.0.24
client_ip_ctrl              10.27.0.24

# Records
num_of_zones                10
domain_name                 e164.arpa
num_of_naptr                1
```

```
# time
limit                3
timeout              1

create_q_files yes

# zone files options
create_zones               yes
restart_software           yes

# MySQL config
create_database              yes
mysql_database               pdns
mysql_user                   pdns_admin
mysql_user_pass              pass

# users and passwords
server_pass               pass-server
```

Within this model, the character # comment, or is preceded by # will not be considered information EnumBenchTool configuration.

3.3 Use

To use the tool you need to perform the configuration running scritp " setup.sh" described above on all computers that will participate in the test being that the Master and Client module can be run from the same machine, and for best operation NOT run this script as root or sudo before the command execution.

After performing the configuration to initialize the tool and run the test should run " enum-bench-tool.py script" find in directory:

"../enum-bench-tool/src/enum-bench-tool.py"

stating which module is desired to run as an option, and the order in which the modules are initialized is of utmost importance.

The Master module must be the last to be initialized as it is responsible for performing the test and need to find the Client and Server so boot, otherwise you must restart the procedure.

- *Client* : >>python enum-bench-tool.py -client
- *Server* : >>python enum-bench-tool.py -server
- *Master* : >>python enum-bench-tool.py -master

3.4 Results

To access the documents generated from the records of the query as results and logs created by EnumBenchTool, access the directory entered in *save_dir* configuration file "session-setup.dat".