AppEX Networks

LotServer Q&A

Part 1: Introduce LotServer

1.1 What is LotServer?

LotServer is the software package with Zeta-TCP acceleration engine built-in to boost the servers' network performance. It supports all mainstream Linux and Windows server editions. LotServer is especially effective for services offered to users widely distributed across the Internet. It is capable of dramatically enhance the user experiences of the long-distance, cross-operator, and/or wireless accesses, promoting the usability of the services. It can also improve the stability of the network connections, lowering the network access failures by a large margin.

LotServer optimizes the overall network experiences of the end users by accelerating the connections and enhancing their stability. Therefore it helps offering high-quality network services over a global scale. For more details, follow the link below:

http://www.appexnetworks.com/products/lotserver.html

1.2 How does LotServer accelerate network connections?

When LotServer is installed to the servers, the acceleration is most effective for the traffic flows in the outbound direction, i.e., from the servers to the accessing clients. For the inbound direction, since the speed is ultimately determined by how fast the clients are willing to send, the actual mileage may vary. However, it will never be worse than without LotServer.

Essentially LotServer is a software module implementing the patented Zeta-TCP algorithm, running in the kernel of the Operating Systems. Zeta-TCP out-performs the traditional TCP algorithms in the following aspects:

1. Intelligent Congestion Window and Recovery algorithms

    Traditional TCP's congestion avoidance algorithms, such as the most commonly used NewReno and its later variations, are largely based upon overly simplified assumption that all losses are indications of network congestion. This assumption is far off the reality of the networks today, especially for wireless networks which is the essence of the personal mobile devices, where losses are the nature of the channels. Other more revolutionary TCP algorithms, led by TCP Vegas, base their congestion predication solely on the end-to-end latency, which is yet another overly simplified and often biased category. Too often, they either perform poorly when running side-by-side with the loss-based algorithms, or send overly aggressively and fail to effectively back off when the congestion really happens.

    Zeta-TCP introduces a number of intelligent algorithms to measure the level or likelihood of

the network congestion based on the traffic statistics such as the variations of both the loss rate and the latency, etc. Therefore it is able to more accurately determine whether the congestion is really happening and apply different recovery algorithms under different situations to maximize the end-to-end throughput.

2. Accurate loss-detection algorithm

Zeta-TCP has its own unique, simple but comprehensive packet-loss detection algorithm with enhanced accuracy and promptness. The traditional TCP frequently makes mistakes in detecting packet losses. In complex packet-loss scenarios, it tends to either identify a merely reordered packet as lost, triggering resend and in turn occupying extra bandwidth, or sit there waiting for more feedbacks from the peer to confirm a lost packet, leaving bandwidth idle. Zeta-TCP's accurate loss detection overcomes these issues by tracking the loss probability for each packet, ensuring shortest response time and best bandwidth utilization.

3. Reverse control and stimulus

Zeta-TCP's reverse control and stimulus algorithm enables it to actively monitor the peers sending behavior and intelligently feedback the peers to allow them to send at the accurately calculated path bandwidths, boosting the bandwidth utilization in the download (inbound) direction. In contrast to the passive data reception and acknowledgement of the traditional TCP, Zeta-TCP's reverse control is the only algorithm in the industry that is capable of accelerating download traffic unilaterally.

In addition to the major enhancements above, Zeta-TCP has a number of other improvements over the traditional TCP. Tested and tuned in years of large-scale field deployment, the unilateral TCP acceleration of Zeta-TCP is now a proven technology which is universally adoptable and highly effective.

For more detailed information, please refer to the Zeta-TCP documents below:

http://www.appexnetworks.com/technology/zetatcp.html

http://www.appexnetworks.com/products/white-papers/Zeta-TCP.pdf

Part 2: Try LotServer Free

2.1 Where can I get LotServer Trial Version?

You can download LotServer Trial by visiting one of the following websites:

1）AppEx Networks homepage http://www.appexnetworks.com: there is a LotServer Trial link in the upper-right corner of the page.

2）LotServer's product web: http://www.appexnetworks.com/products/lotserver.html.

3）Directly download from AppEx download site: http://download.appexnetworks.com.

All the download requests will be ultimately handed over to AppEx Networks' download server: http://download.appexnetworks.com.

2.2 What Operating Systems does LotServer support?

LotServer natively supports mainstream Linux and Windows server editions. For Linux, LotServer supports most versions of CentOS and RedHat Enterprise, as well as some of Ubuntu and SUSE versions.

The detailed platform list is published on LotServer's download website at http://download.appexnetworks.com.

2.3 What if my servers' OS are not in the support list?

On Linux platforms, LotServer's Zeta-TCP engine is a Linux kernel module. Therefore it has to match the kernel versions, configurations, and sometimes GCC toolsets used to compile the kernels. If your systems are not in the support list, you can submit the relevant information of your OS online. AppEx will review your system information and configurations to determine if an existing LotServer package already satisfies your system. Otherwise the supportability will be evaluated and a new platform package may be created. Typically the process of evaluation and packaging for Linux should not exceed 2 weeks in total.

You can submit your server information by the following web link:

http://download.appexnetworks.com/wversion.do?m=lotServerFeedback

Currently we offer support for Linux and Windows servers only. We welcome your requests for other platforms, e.g., AIX, Solaris, etc. However, it may take longer time and require more information about your servers.

2.4 How long can I try LotServer? How many servers am I allowed to install LotServer Trial on?

By default you are allowed to try LotServer for one week starting from the date when your trial account is created. During the trial period you can install LotServer in no more than 6 servers per account.

2.5 What if I wish to continue using it after the trial period is over?

If you wish to keep running LotServer after the trial period is over, you can apply online for an extension of the trial. In the application, please fill in the information about LotServer's trial run results / evaluations, the reasons for and the length of the requested extension. AppEx trial administrators will review the applications and may contact you by phone or email. Once approved, you just need to re-download the software package and reinstall in your servers.

2.6 Help! I'm having trouble installing / running LotServer.

First of all, please read the FAQ section of this Q&A to see if your issues have been addressed and apply the solutions accordingly. Many of the frequently encountered problems are documented there. If it still doesn't solve your problems, please don't hesitate to contact our tech support.

We recommend you communicate with our support online. There is a "Customer Support Online" found on our download site at http://download.appexnetworks.com. The email support information is also found on LotServer's product web: http://www.appexnetworks.com/products/lotserver.html.

2.7 How easy is it to try LotServer?

It is very simple to try out LotServer. Depending on whether you choose automatic or manual installations, all you need is just to follow 3 or 4 easy steps:

1. Automatic installation:
    a) Register user information
    b) Download the installation file
    c) Install LotServer onto your servers
2. Manual installation:
    a) Register user information
    b) Submit servers information
    c) Download LotServer software
    d) Install and run LotServer on your servers

2.8 How to register a user (sign-up)?

Simply click the "Sign-in/Sign-up" at the upper-right corner of AppEx Networks download site:

http://download.appexnetworks.com

A pop-up dialog will guide you through the user registration process. We ask for very little

information from you. After you've successfully signed up, you can sign-in your account with the email address and password you supplied at the registration.

Part 3: Installing and running LotServer (Linux)

3.1 How to install LotServer?

LotServer web distribution page in the download site offers two installation methods: automatic or manual. Regardless of which method you choose to use, you will need root privileges of your servers to successfully install LotServer.

1. Automatic installation:

   We recommend automatic installation as it is the easiest method to setup LotServer. Simply select the "Automatic Installation" tab after you've signed into your account and you are on your way. Follow the instructions given on the web page.

   After the installation has finished, the installer will display the completion information about whether the process has been successful. There are typically 3 different outcomes:

   i) Success.

   ii) The automatic installer failed to locate the LotServer software compatible with the server platform. The installer will exit after showing the error message.

   iii) The account has run out of licensed number of copies to install. The installer will exit after showing the error message.

2. Manual installation:

   If your servers don't have internet access for some reason, you can choose manual installation to download LotServer to your PC that has the access to the download site, then copy the file to the server to install and run.

   Detailed instructions can be found on the "Manual Installation" tab of the LotServer download site.

3.2 How to run LotServer?

1. Directories and files installed

   After a successful installation, the installer will have created a /appex directory under the file system root. All the LotServer related files and sub-directories are created under this directory. The following table lists and explains these LotServer files and directories.

Path	Type	Descriptions
/appex/	Dir	The root of the AppEx LotServer installation. All the LotServer related files and directories are created under it.
/appex/bin/	Dir	Stores LotServer executable binaries and scripts.
/appex/bin/acce-xxx	File	LotServer executable binary.
/appex/bin/lotServer.sh	File	LotServer start script.
/appex/etc/	Dir	Stores LotServer license and configuration files.
/appex/etc/apx-xxx.lic	File	LotServer license file.
/appex/etc/config	File	LotServer configuration file.
/appex/log/	Dir	Stores LotServer runtime logs and capture files for diagnosis purposes.

2. Common parameters

You can modify file /appex/etc/config to set or alter LotServer's parameters. The following are the most commonly used ones and their usages:

accif="eth*"

The network interface to be accelerated. eth* should be the interface that the server offers network services, e.g., eth0, eth1, … Command "ifconfig" can be used to obtain the names of the interfaces.

acc="1"

Whether to enable TCP acceleration. To enable the acceleration, set this parameter to 1. Otherwise 0.

csvmode="1"

The "Conservative Mode" enabler. Setting it to 1 enables the Conservative Congestion Control Mode, and 0 disables it. When TCP acceleration is enabled, the effective data rate may drop under certain patterns of heavy packet losses. Enabling the Conservative Mode will prevent such degradation from happening. However, it may also result in slightly lower acceleration ratio.

wankbps="1000000"

The outbound bandwidth of the accelerated network interface. This value should be the maximum bandwidth for the traffic flowing from the server to the internet. The unit here is Kbit/s. e.g., if the maximum bandwidth to the internet is 1Gbit/s, set this parameter to

1000000.

waninkbps="1000000"

The inbound bandwidth of the accelerated network interface. This value should be the maximum bandwidth for the traffic flowing from the internet to the server. The unit is Kbit/s. e.g., if the maximum bandwidth to the server is 1Gbit/s, set this parameter to 1000000.

Ideally, wankbps and waninkbps should be set to the same values of the real bandwidth allocated to the server. If it is hard to determine the real bandwidth, or the bandwidth is dynamically shared with other servers or devices, then they can be simply set to the throughput that the accelerated NIC offers. e.g., if the NIC is a full-duplex Gigabit Ethernet card, then these parameters can be set to 1000000. If these parameters are set lower than the real bandwidths, then the traffic flows in and out the server will be bound by the values configured, i.e., the throughput will be lowered.

apxexe=" /appex/bin/acce-*"**

The LotServer executable binary's file name.

apxlic="/appex/etc/apx-*.lic"**

The LotServer license file name.

3. Running LotServer

Starting LotServer: **/appex/bin/lotServer.sh start**

This command loads up the LotServer kernel module and starts the Zeta-TCP engine, applying the configurations in file /appex/etc/config.

Stopping LotServer: **/appex/bin/lotServer.sh stop**

This command stops the Zeta-TCP engine and unloads the LotServer kernel module. It's best to make sure no processes are accessing directory /proc/net/appex/, for example, a command console with current directory set to /proc/net/appex/.

Applying new parameter settings on-the-fly: **/appex/bin/lotServer.sh reload**

This command does not unload the LotServer module. After you have modified file /appex/etc/config, you need to run this command to have the changes take effect.

It is important to note that TSO (TCP Segmentation Offload) and GSO (Generic Segmentation Offload) will prevent LotServer from intercepting network packets and therefore break network connections. Please make sure that both TSO and GSO on the accelerated network

interface are turned off before running LotServer. You can query the TSO and GSO status with command "ethtool –k eth*". Use "ethtool –K eth* tso off" and "ethtool –K eth* gso off" to turn off these features. When you launch lotServer.sh to start LotServer, it will automatically run ethtool first to turn off TSO and GSO. If ethtool returns failure, the script will stop loading LotServer.

3.3 How to uninstall LotServer?

You must first make sure that LotServer is not running. Then you can choose either of the following methods to uninstall LotServer:

1. Uninstall with the installer script: ./lotServerInstaller.sh uninstall
2. Simply remove the installation directory: rm –rf /appex

Part4: FAQ

4.1 What information will the automatic installation script send back to the LotServer web distribution server?

When you choose to install LotServer automatically, the installer script will send the following information back to the web distribution server, after you have successfully signed into your account:

1) The unique server serial number used for license.
2) The Linux code name and version of your server, such as: CentOS 5.2, Red Hat 5.6, Ubuntu 10.4, etc.
3) The Linux kernel version of your server. e.g., Red Hat 5.6 Standard would have kernel version 2.6.18-238.el5.
4) The processor architecture of the server OS. e.g., i386 or x86-64.

Except for the items above, which are necessary for the distribution server to identify the proper binaries to install and generate license files, the script will not send back any extra information.

4.2 Why does automatic installation fail sometimes?

The following are some of the possible causes of the installation failures:

1) You do not have root privileges.
2) Your server cannot connect to the internet or the web distribution server.
3) You have entered incorrect user email address and/or password.

4) Your account has reached the upper limit of the number of servers licensed to install LotServer.

5) Certain firewalls or security devices in your network could have blocked your communication with the web distribution server.

4.3 Why does manual installation fail sometimes?

Some of the possible reasons are:

1) You do not have root privileges.

2) The manual installation file you have downloaded is damaged.

3) Some security settings in your server may forbid you from installing new software.

4.4 LotServer failures caused by shared-memory settings:

If you see the following error messages when running LotServer:

shmget: Invalid argument

....

Loading LotServer failed!

Then it usually indicates that the system shared memory is set to 0. You can use command "ipcs –l" to check the settings. If the following messages are displayed:

------ Shared Memory Limits --------

max number of segments = 4096

max seg size (kbytes) = 0

max total shared memory (kbytes) = 0

min seg size (bytes) = 1

The lines marked red indicates that shared memory and maximum shared memory are both set to 0. LotServer requires some amount of shared memory to start. That's the reason of the LotServer start failure. The following system parameters can be used to set the shared memory limits:

/proc/sys/kernel/shmall (typically can be 268435456)

/proc/sys/kernel/shmmax (typically can be 4294966272)

You can set these parameters with the typical values given above, or adjust them to satisfy the need of your system. Please note that directly echoing to the proc-FS entries will not persist throughout system reboot. To permanently set the new values, it is recommended to modify the values of "kernel.shmall" and "kernel.shmmax" in sysctl.conf.

About these 2 parameters: **SHMALL** controls the total amount of shared memory (in pages) that

can be used at one time on the system; **SHMMAX** is used to define the maximum size (in bytes) for a shared memory segment. The larger they are, the better cache performance will be.

4.5 How do I verify that LotServer has been successfully installed?

You can check that the installation target directories and files are created. The detailed directories and files list is in this Q&A "3.2 How to run LotServer?".

4.6 How do I determine that LotServer is successfully running?

You can run Linux command "lsmod" and check if a module named "appex0" exists to ensure that LotServer has been successfully loaded. Then "cat /proc/net/appex/stats" to verify that LotServer is successfully running.

4.7 How much server system resources does LotServer take?

It primarily depends on how many active connections the server is currently serving. Normally LotServer should not take more than 200MB memory and 10% CPU.

4.8 I have launched LotServer successfully. But why can't I see any improvements?

Some of the possible causes are:

1) The accelerated network interface ("accif") is not correctly set.

2) The testing clients have near-perfect conditions in the network path to the server, e.g., (almost) no packet losses and stable low latency. Then the performance before and after the acceleration won't differ much.

3) The server's internet outbound bandwidth has been fully occupied. Hence there is no usable bandwidth for improvement.

4) The network services that your server offers is not primarily TCP based.

5) The bottleneck of your service performance lies not in the network, but in the backend data processing.

4.9 Why my server's throughput goes down a little instead after installing LotServer?

Some possible reasons are:

1) The bandwidth settings in the configuration file are lower than the actual bandwidth capacity your server may acquire.

2) Your server is already close to full-load before running LotServer.

4.10   LotServer exits shortly after it is successfully launched by the script, why?

If there are no error messages when running the script to start LotServer; commands "dmesg", "logread", etc., show no abnormal information in the logs related to "appex"; and "lsmod" indicates appex module is first loaded then disappears after a few seconds (usually less than 10 seconds); then it is most likely to be caused by the license issues. You will need to update the .lic file.

4.11   The network connection is lost after TCP acceleration is turned on?

Please make sure that TSO (TCP Segmentation Offload) and GSO (Generic Segmentation Offload) features of the accelerated network interface are both turned off. These offload features divert part of the packets from the LotServer's Zeta-TCP engine, causing broken network connections. You can use command line "ethtool –k eth*" on tso or gso to verify if any of them are turned on. Use "ethtool –K eth* tso off" and "ethtool –K eth* gso off" to turn them off. You may need to install ethtool command if it does not exist in your system yet.

4.12   My system runs abnormally after LotServer is launched. What should I do?

You can dump the system logs using commands like "dmesg", "logread", etc. If you see any messages have "appex" in them, then the issues could be related to the LotServer module. Please contact us with the log information to solve your issues.

4.13   My server's memory usage shoots up very high after LotServer is started.

If you see memory usage problems, please dump the information in /proc/slabinfo. Then please contact us with the information you have collected to solve your problems.

Boost Networks

AppEx Networks Corporation

22434 Riverside Drive

Cupertino, CA 95014

+1-408-352-5768

lotserver@appexnetworks.com

www.appexnetworks.com