Software Defined
Network Address Translator

by Denis Plotnikov

What is Network Address Translator (NAT)?

- A kind of special data network equipment

- Standard and integral equipment for Internet Providers data networks

- If high performance needed – specially designed device is used **which costs a lot**

A regular high-performance NAT device looks like this

The problem

A high-performance NAT costs a lot:

Around $6000 per 10 Gpps at minimum
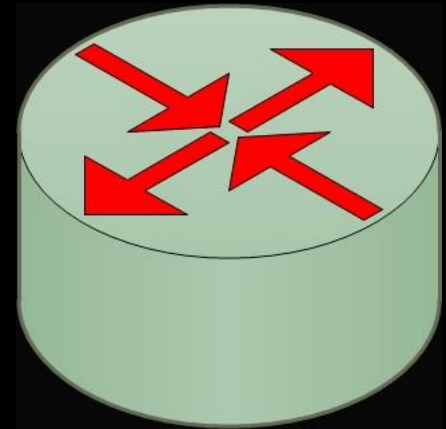
How can we make it cheaper?

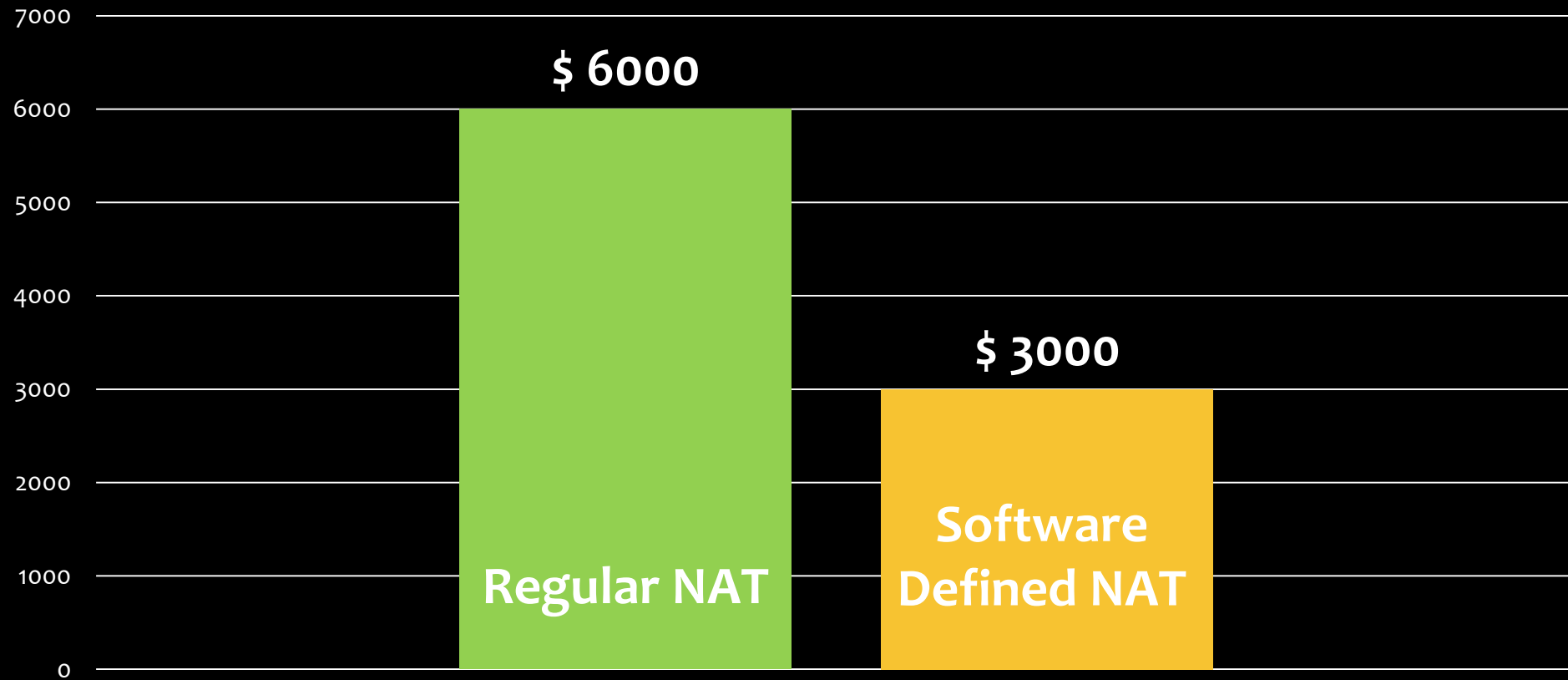**A cheap regular server** + **Our software package** = **Software Defined NAT**

Benefits of using a Software Defined NAT?

- Twice cheaper than regular one, having the same performance rate

- Easily upgradable

- Easily maintainable

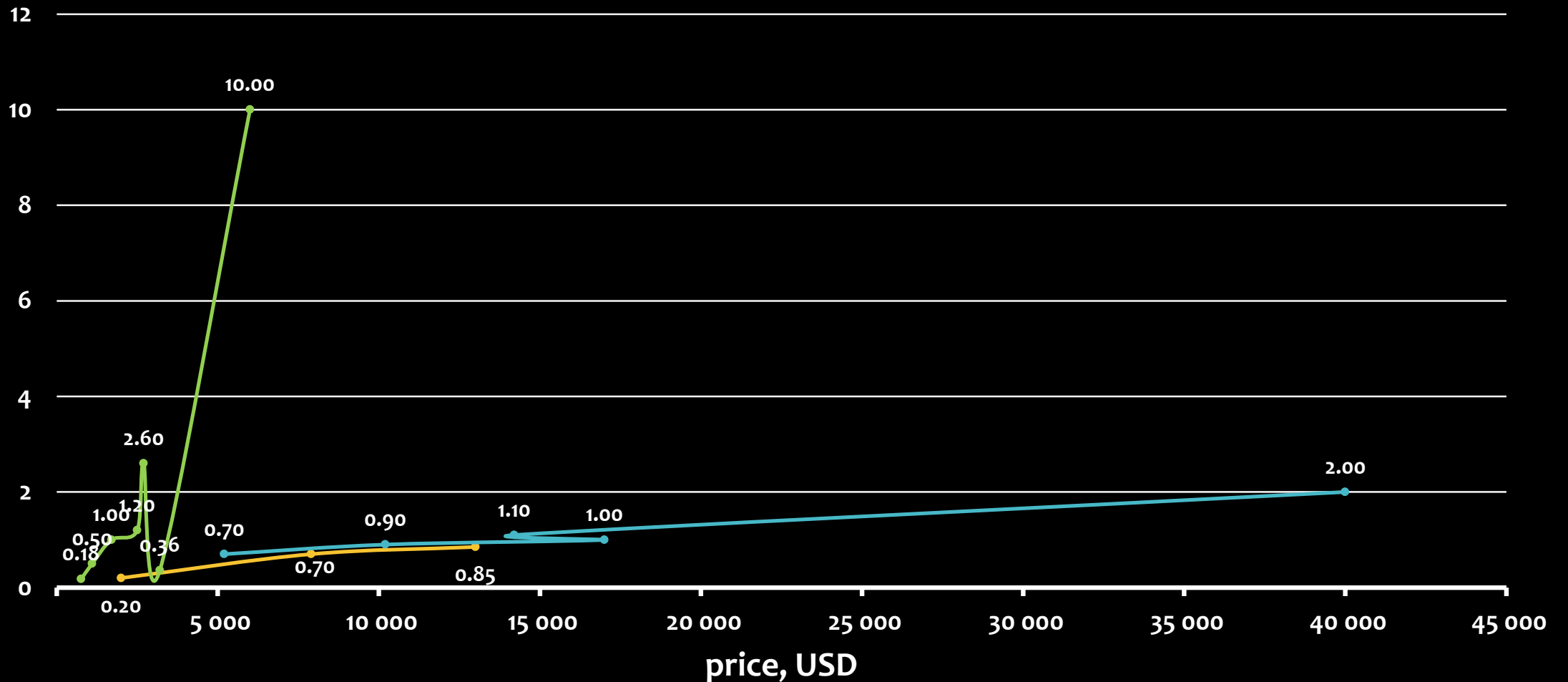- More performance on upcoming processors

THANK YOU!

High-performance NAT prices

Performance/price
routers with NAT

[Mpps]   ●— Juniper ●— HP ●— Cisco

12

10 ——————— 10.00

8

6

4

2.60

2 ——————— 2.00
1.00 1.20   1.10 1.00
0.50 0.36   0.70   0.90
0.18   0.70   0.85

0
0.20   5 000   10 000   15 000   20 000   25 000   30 000   35 000   40 000   45 000

price, USD

Software defined NAT Target Characteristics

- Throughput: 10G bits per sec

- Packet processing rate: 10M packets per sec

- Connection setup rate: 3M sessions per sec

- Concurrent session support: 65.5M sessions

What makes our software to work so fast?

- High-performance software design principles

- Specially designed for fast processing of packet data

- Parallel computations

- Intel© DPDK framework

Software defined NAT cost price estimation

Component name	Model	Price, $
Processor	Intel Core i5-4690	220
RAM Modules	SiliconPower SP016GXLYU16ANDA x2	320
Motherboard	SuperMicro X10SLL-S (Intel C222)	200
Hard Disk	Intel DC S3610	275
Network Interface Card	Lenovo 10Gb X540-T2	600
System Unit	SuperMicro CSE-732D2-500B	200

TOTAL: $1815

Who did this?

<u>Denis Plotnikov</u> – a Skoltech student

under supervision of two Intel© professionals:

<u>Vadim Sukhomlinov</u> – Strategic Business Development Manager

<u>Areg Melik-Adamyan</u> – PhD, GNU Toolchain Manager