lopoco

low power systems

Company Introduction

WHAT

- Created to make server and storage products to help datacenters and IT customers save operating and maintenance costs

HISTORY

- Started in early 2010
- We were looking for servers that get the job done, but:
  - operate at a fraction of the cost of conventional servers
  - are silent, or close to it
  - generate a fraction of the heat
  - have performance and capacity at a decent price
- One year later, we released the LP-2180 microserver family, and LP-2220/ LP-4240 and LP-6240 medium and heavy duty server families.
  - 80% less power consumption, half the size, silent, competitive price
  - based on existing motherboards

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Company Introduction

CURRENT CUSTOMERS

LIGHT & MOTION

SYMSOFT SOLUTIONS
Creation through Collaboration

methodics™

StumbleUpon

TARGET CUSTOMERS

amazon.com

ebay

YAHOO!

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- power is a major problem in datacenters - frequently more of a limiter than performance or floor space
- laptop silicon has lower power than server silicon with minimal performance impact
- however, laptop motherboards are not suitable for datacenters because:
  - they add many chips which are not useful in the datacenter and burn power
  - they omit or restrict functions needed in the datacenter like large memory address space, disk, I/O connectivity, expandability

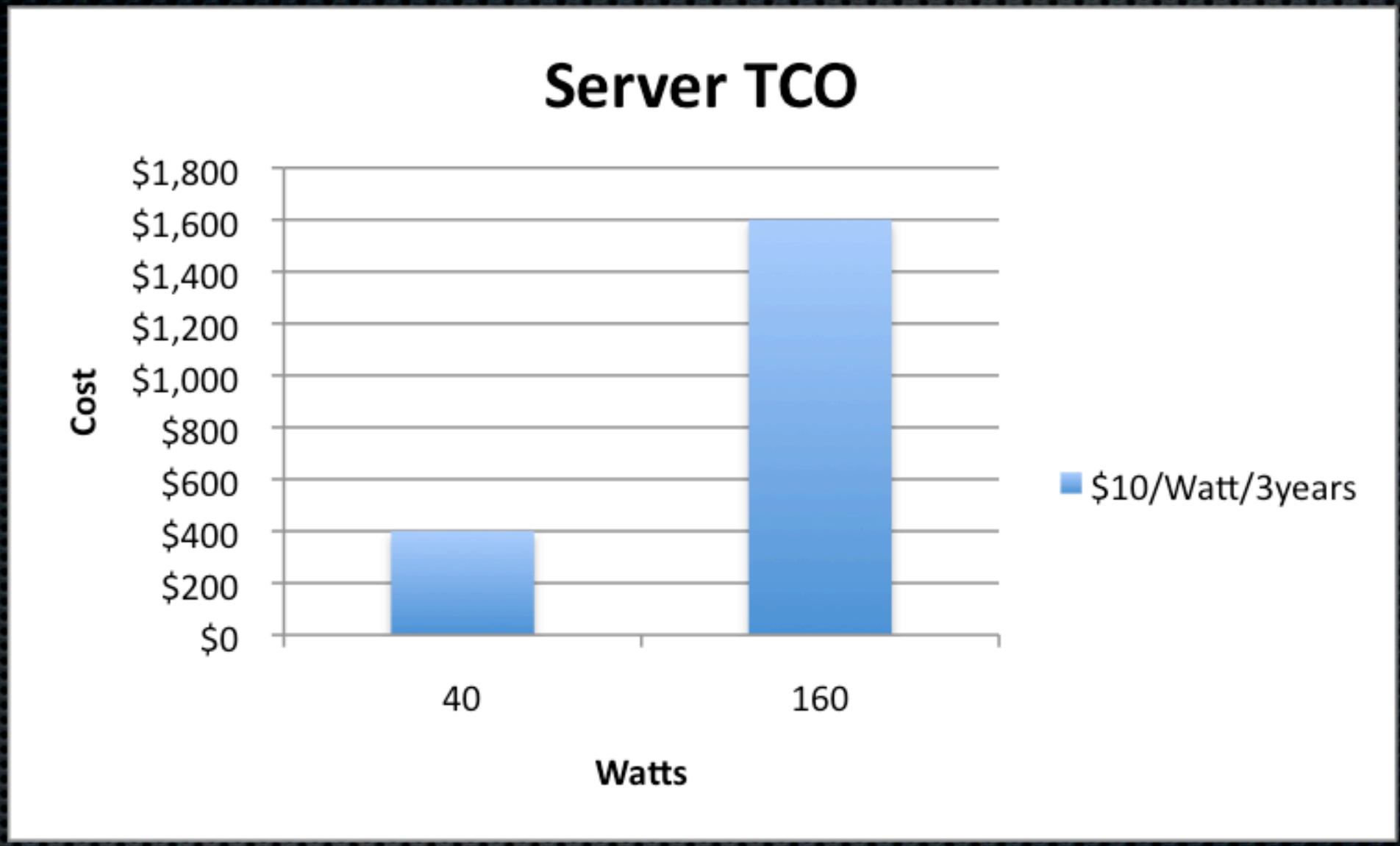
Lopoco v. Conventional Servers

	Lopoco	Hewlett Packard	Dell
Model	LP-4240 Family Quad core, 2 Ethernet, 2 disks	DL-320 Quad Core, 2 Ethernet, 2 disks	R510 Quad core, 2 Ethernet, 2 disks
Idle Power Consumption	25 Watts	160 Watts	165 Watts
TDP Max Power Consumption	65 Watts	300 Watts	325 Watts
Savings		235 Watts	260 Watts

Lopoco v. Conventional Servers
Customer Owned Datacenters

EMEA customers	Per 1000 Servers	Electricity	HVAC	Totals	Savings **per year**
90% avg. load	Conventional	$525,600	$525,600	$1,051,200	$840,960
	Lopoco	$105,120	$105,120	$210,240	
idle load	Conventional	$280,320	$280,320	$560,640	$473,040
	Lopoco	$43,800	$43,800	$87,600	

Leased Datacenter



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Lopoco Motherboard Proposal

there exists an opportunity for motherboards designed to use laptop silicon, but customized for use in the datacenter

Lopoco Motherboard Proposal

- lopoco designs the motherboard and retains IP rights
- Whizz builds it and sells it to lopoco with no up front cost to lopoco
- any NRE is amortized over the first 10,000 units as lopoco buys them

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Custom Motherboard Advantages

LP-2220/LP-4240 Medium Weight	Custom Motherboard
2 or 4 core workhorse with excellent idle power usage as well as constrained TDP; based on Intel E3-1220L & 1260L processors and Supermicro motherboard	• Custom designed to use ULV/LV or laptop memory • Mobile Gigabit PHYs • 5 volt fan headers • Small number of USB ports • Power limited PCIe slots

• 2/4 or 4/8 core/thread
• 4-32 GiB DDR3 ECC
• 2 Intel Gbit LAN
• up to 6-10 SATA disks
	• Form factors
	  • twin-server applications
	  • blade servers
	  • short case depth servers (mini-ITX)

• 20 watts idle / 55 watts TDP • Competition: 40 watts idle / 110 watts TDP • 50% power improvement	• 15 watts idle / 50 watts TDP • Competition: 40 watts idle / 110 watts TDP • 62.5% power improvement

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Custom Motherboard Advantages

LP-4300 Medium Weight	Custom Motherboard
4 core workhorse with best idle power usage with excellent performance headroom; based on Intel Mobile Core i5/i7 processors	• Mobile Gigabit PHYs • 5 volt fan headers • Small number of USB ports • No (or disabled) audio or special video • Multiple PCIe slots (power limited)

• 2/4 or 4/8 core/thread
• 4-32 GiB DDR3 ECC
• 2 Intel Gbit LAN
• up to 6-10 SATA disks
	• Form factors
	  • twin-server applications
	  • blade servers
	  • short case depth servers (mini-ITX)

• 15 watts idle / 65 watts TDP • Competition: N/A • 50-80% power improvement	• 10 watts idle / 60 watts TDP • Competition: N/A • 75-90% power improvement

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