



Competitive Guide  
Intel® Advanced Technologies  
Business Enterprise

# Competitive Comparison

## Intel® I/O Acceleration Technology vs. TCP Offload Engine



Rely on Intel® I/O Acceleration Technology<sup>†</sup> (Intel® I/OAT) to boost server I/O throughput with fast, scalable, and reliable network acceleration in your Quad-Core and Dual-Core Intel® Xeon® processor 5000<sup>▲</sup> sequence-based servers. Intel I/OAT is the new acceleration technology that outperforms the TCP offload engine (TOE) approach and delivers leading network and I/O performance.

### Intel I/OAT:

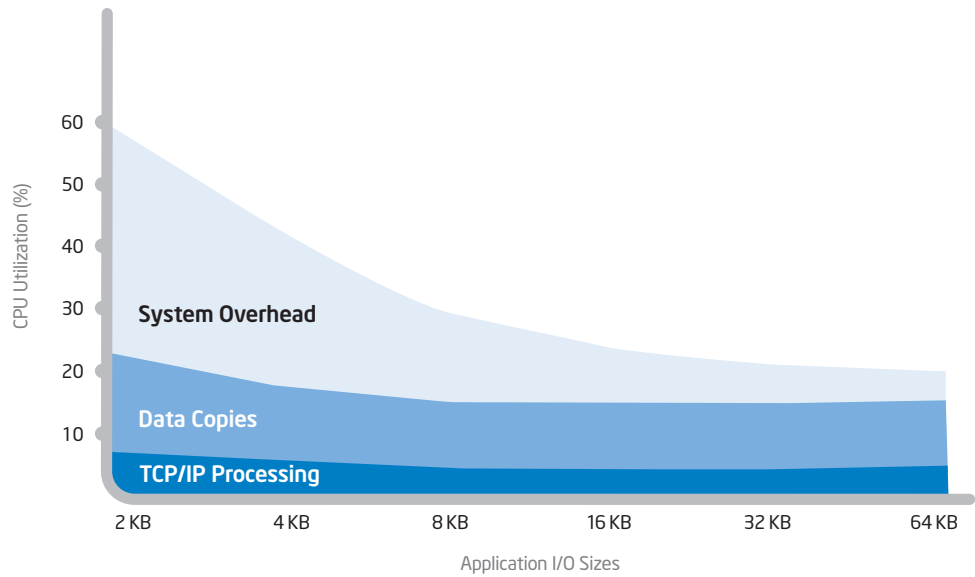
- **Reduces CPU overhead** by improving data flow in the network, chipset, and host operating system (OS), leaving more application processing overhead.
- **Is a safe and flexible I/O acceleration choice** with broad industry support, including Microsoft Windows\* Server 2003 and leading Linux\* distributions.
- **Uses native protocol stacks** to avoid support risks of third-party network stacks.
- **Preserves existing network capabilities**, like teaming, failover, and virtual LANs (VLANs).
- **Significantly outperforms TOE** throughput and CPU utilization in network, teaming, and application tests.





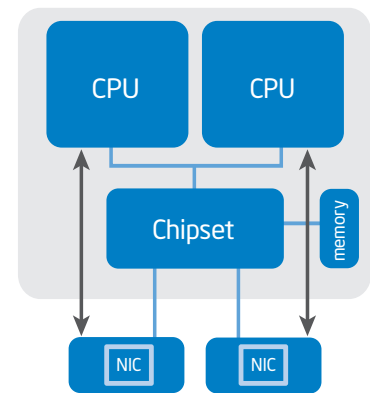
## A Platform Solution

System I/O throughput challenges are not isolated to the network connection. They're present throughout the platform. TOE focuses on only the network connection by offloading TCP/IP processing to silicon on the network interface card (NIC). Intel I/OAT uses a platform-wide approach, integrating processor, chipset, and OS enhancements, significantly improving data movement through the platform.



Component Overheads	Cycles/ Instruction
Interrupts	Very High
Indicate signaling	High
Completion signaling	High
Data copies	Very High
TCP processing	Low
TCP classification	Low

System overhead components and impact on the CPU



Server platform block diagram

# Safer Choice — Supported by More OS Vendors

Leading OS vendors support Intel I/OAT with native protocol stacks instead of relying on third-party stacks, making it a safer choice when it comes to maintenance and support. Plus, Intel I/OAT supports multiport teaming for redundancy, increased network throughput, and fewer NICs in a server.

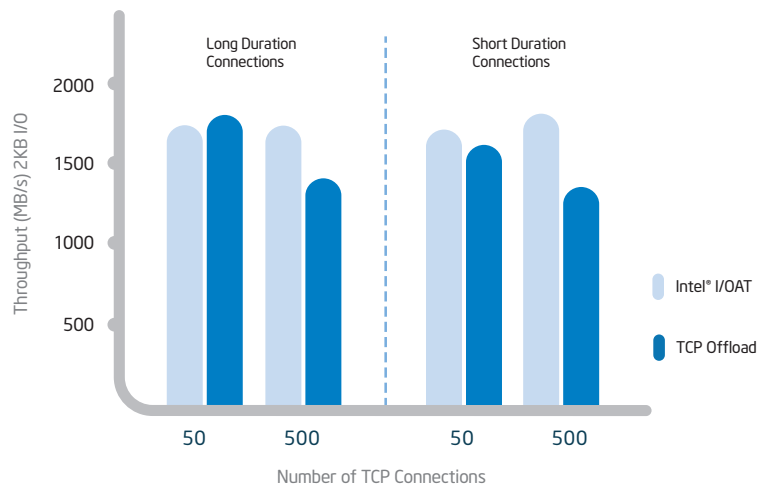
Operating System	Intel® I/OAT	TOE
Microsoft Windows* Server 2003 Scalable Network Pack	Yes	Yes
SuSE SLES10*	Yes	No
Red Hat RHEL5*	Yes	No

## Leading Performance<sup>1</sup>

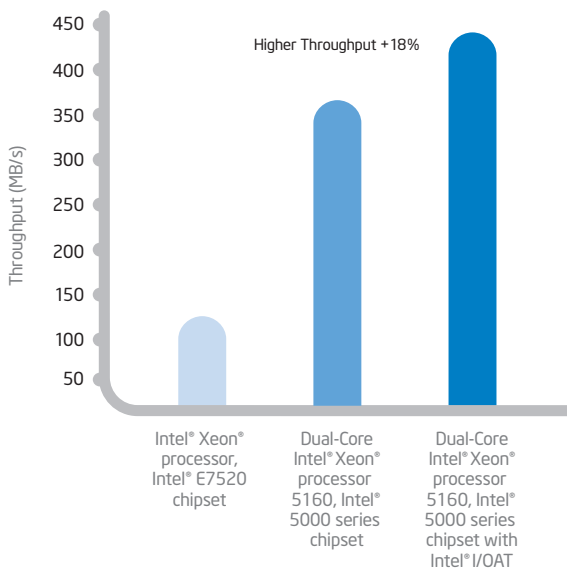
### Intel I/OAT vs. TOE

- Significantly outperforms TOE in server configurations that support a large number of users and which require long-lived connections (e.g., backups/restores, streaming media serving, large file transfers).
- Significantly outperforms TOE on short-lived connections (database, mail, and file serving).
- Significantly outperforms TOE in teamed interfaces.
- Provides a much better solution in iSCSI-based environments.

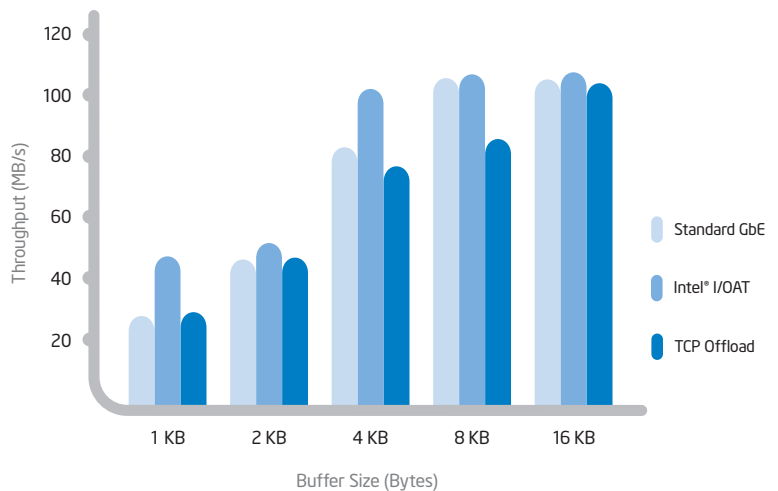
Front-End Server Throughput



Veritas Network Backup Performance



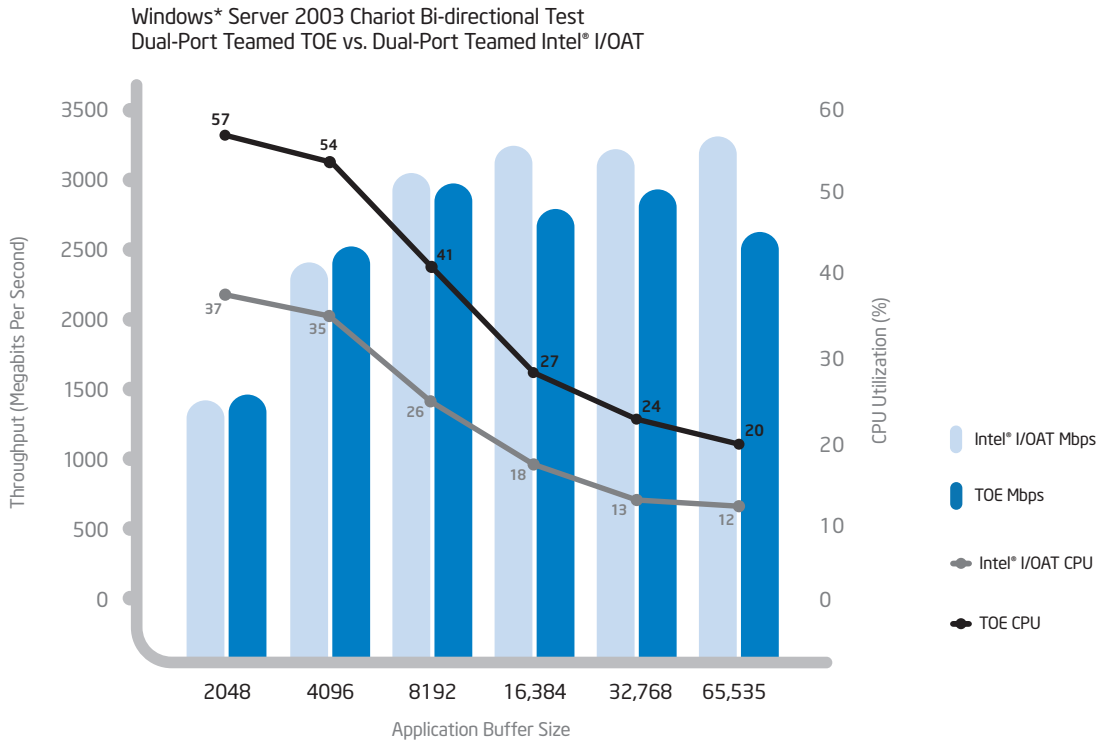
iSCSI Network Storage



Intel Internal Measurements, date of the data

# Better CPU Utilization in Teamed Environment

Provides lower CPU utilization than TOE in teamed interfaces.



For more information on Intel I/O Acceleration Technology and how it delivers fast, scalable, and reliable network acceleration, visit [www.intel.com/go/iaot](http://www.intel.com/go/iaot).

Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported. Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel® products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, reference [http://www.intel.com/performance/resources/benchmark\\_limitations.htm](http://www.intel.com/performance/resources/benchmark_limitations.htm) or call (U.S.) 1-800-628-8686 or 1-916-356-3104.

<sup>1</sup> For more information on published performance results, go to [www.intel.com/technology/iaacceleration/](http://www.intel.com/technology/iaacceleration/).

<sup>2</sup> Intel® I/O Acceleration Technology (Intel® I/OAT) requires an operating system that supports Intel I/OAT.

<sup>3</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [http://www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details.

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