



HARDWARE ACCELERATION MEETS OPEN SOURCE BACKUP – A KILLER COMBINATION

Zmanda, the leader in open source backup, has teamed up with Indra Networks, the leader in hardware acceleration cards, to address the challenges faced by small to medium sized organizations in backing up their valuable data.

Customer Challenges

Continuously increasing data, along with shrinking backup windows due to 24/7 operation are a constant challenge for backup administrators. A common solution is to backup to disk, rather than tape, since disk has better performance characteristics. However, this increases the total cost. The cost can be reduced by compressing data in real time as it is backed up, but this greatly increases the load on the CPU.

Further, with increasing emphasis on data security, more and more organizations have to encrypt their data. Apart from the additional computational burden, encryption also introduces the need for careful key management. On one hand, losing a key can mean inability to recover critical data, on the other hand, if the key falls into the wrong hands, it defeats the purpose of encryption in the first place.

The Solution - from Zmanda and Indra Networks

Indra Networks' StorSecure 300 product is the basis for solving this problem. In a single PCI-X card, this product offers acceleration of compression and encryption, along with easy to use key management functionality. However, to benefit from this product, the backup software must be integrated with StorSecure, using APIs provided by Indra Networks. Fortunately, Amanda Enterprise Edition from Zmanda has a flexible architecture that makes this integration very easy. Indra and Zmanda have worked together to create this solution.

To use this solution, a customer using Amanda Enterprise Edition simply purchases StorSecure 300 from Indra Networks and installs the supplied software. With a small change to one of the configuration files, compression and/or encryption are enabled. A GUI provided by Indra Networks is used to create, manage, delete and backup the encryption keys. The keys are stored in flash memory on the StorSecure card itself and are accessible to the administrator only. However, any process running on the system is able to encrypt and decrypt data using the stored keys. Hence, any backup or restore process can use this functionality without worrying about keys. The administrator is responsible for occasionally backing up keys and saving them in a safe location. A USB flash drive is an ideal device for creating such backups.

“The hardware cards from Indra radically improve the performance of the backup system. Our customers have found this to be an excellent feature enhancement of our product.”

**Ram “TK”
Krishnamurthy**
VP Support and Services
Zmanda

Performance Results

To illustrate the benefits of hardware acceleration, a number of performance measurements were made. The following hardware setup was used:

Backup server: Intel Pentium 4 (2.66 GHz) with StorSecure 300
Backup software: Amanda Enterprise 2.5.1
Backup data size: 1.3GB
Backup network: 1Gbps Ethernet
Backup device: internal disk on the server

Two backup client machines were used to simultaneously backup data to the backup server.

To establish a baseline, the data was first backed up with no compression. Then, it was backed up with software compression available with Amanda Enterprise Edition. Then, hardware compression with StorSecure 300 was enabled. Finally, both compression and encryption in StorSecure 300 were enabled simultaneously. The table below shows the backup time and CPU utilization during the test, for all four test cases.

<i>Type</i>	<i>Time taken (sec)</i>	<i>CPU utilization (%)</i>
No compression	336.5	12%
Software compression	229.9	65%
Hardware compression	167.6	18%
Hardware compress & encrypt	167.6	18%

Observations

Turning on compression saves backup time, because there is less data to write to the disk. However, if compression is done in software, the CPU utilization is greatly increased and time savings are minimal. On the other hand, hardware compression provides 2:1 reduction in backup time, with a very modest impact on CPU utilization. Most importantly, turning on hardware encryption had no significant impact on backup time or CPU utilization. This is because StorSecure 300 has the unique ability to compress and encrypt data in a single pass.

The latest version of Amanda enterprise edition (2.6.2) has significant improvements (including Web based management console). For more information, visit <http://www.zmanda.com/amanda-enterprise-edition.html>

About Zmanda

Zmanda is a leader in open source backup and recovery. Amanda Enterprise Edition is the certified and supported version of the world's most popular backup and recovery software [Amanda](#). Based out of Sunnyvale California, Zmanda's R&D center is based in Pune, India. For more information visit www.zmanda.com

About Indra

Indra is a leader in hardware based encryption and compression technology. Indra's SS™ & SC™ series of cards help servers and backup appliances relieve processor overheads during real time compression and encryption of data while it is being backed up. Based out of San Jose, CA, Indra's R&D center is based out of Pune, India. For more information visit www.indranetworks.com