

Enterprise Hardware/Data Center Infrastructure

Trends In IT Hardware: The Era of Dynamic Hyperconvergence

REPORT HIGHLIGHTS: Yesterday, privately held Pivot3 surprised the storage world with an acquisition and a new term. The company announced a definitive agreement to acquire NexGen Storage (also private), broadening out its traditional hyperconverged offerings to include hybrid and all flash arrays. The company also announced that NexGen's critical QoS and dynamic tiering capabilities would be incorporated into core Pivot3, enabling 'dynamic hyperconvergence.' We believe this is a differentiated view in the space and could help the company to establish a larger presence within the enterprise and even service provider worlds.

- On January 27, Pivot3 (one of the innovators of the hyperconverged systems movement) announced that it had signed a definitive agreement to acquire privately held NexGen Storage for an undisclosed amount. The deal is expected to close in February.
- Colorado-based NexGen storage was co-founded in 2010 by serial storage entrepreneur John Spiers (former co-founder and CTO of LeftHand Networks) as a hybrid array company focused on delivering solutions utilizing extremely fast PCIe cards for fast tiering and low-cost HDDs for storage. These cards initially were from Fusion-io (at great cost) but later diversified to other vendors and also included tiers of SSDs in addition to HDDs. Today NexGen sells all-flash and hybrid arrays.
- **Rationale for the transaction.** For Pivot3, which has seen strong adoption of its hyperconverged solution, the task of enhancing its management software platform to include enterprise-grade features is an ongoing task. We believe NexGen accelerates their time to market for QoS (which manages performance targets and importantly I/O prioritization), thus ensuring the most important applications are achieving their service level requirements and not getting bogged down by lower-priority workloads ahead in the queue. Especially in the service provider world, QoS is essential for a multi-tenant environment. NexGen also bolsters Pivot3's R&D efforts and broadens their product offerings for those customers with a need for more traditional storage solutions now but a desire for a hyperconverged roadmap later.
- **Needham's take:** Pivot3 terms the inclusion of NexGen technology and solutions in its stable of offerings as 'dynamic hyperconverged'. We are particularly interested in the QoS and dynamic tiering capabilities of the NexGen solution finding their way (hopefully in short order) into Pivot3's solutions. We find these features critical for enterprises to continue to move hyperconverged into more mission-critical workloads. But not all applications and workloads are destined for a hyperconverged solution. Pivot3, in contrast to others in the space, now offers all-flash arrays, hybrid and hyperconverged. We will be watching the company closely in 2016 to see customer adoption for this innovative approach to the market.

Companies Mentioned in Report:

- SanDisk Corp. (SNDK: \$64.21, PT: NA)
- Pivot3 (PVT)
- NexGen Storage (PVT)

Topic of Discussion:

*Hyperconverged Infrastructure -
Pivot3's acquisition of NexGen Storage*

Contributing Analysts

Richard Kugele

(617) 457-0908

rkugele@needhamco.com

David Rold

(617) 457-0938

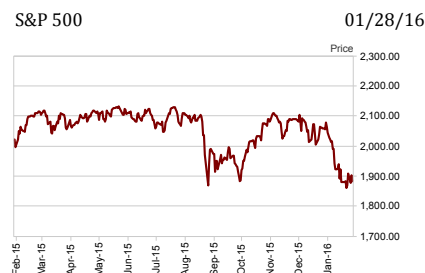
droid@needhamco.com

Kimberly Donovan

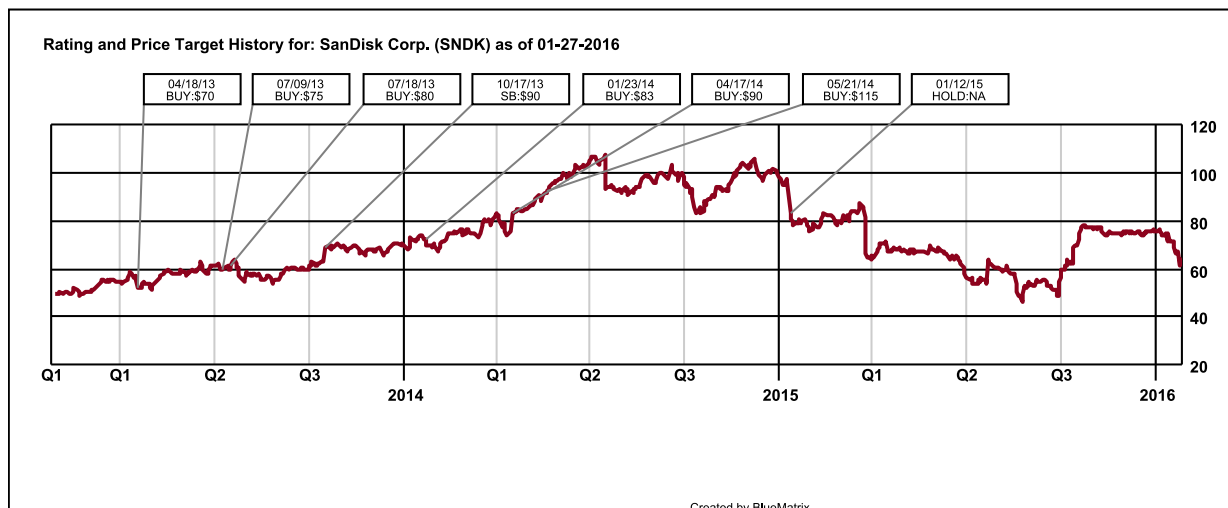
(617) 457-0922

kdonovan@needhamco.com

Sector Chart



- **Additional Background on NexGen.** NexGen was acquired by Fusion in April 2013, but took much of the next 8 months+ to further invest in its software's enterprise functionality and develop its channel relationships. By the time this process was complete, Fusion fell on hard times and was itself acquired by SanDisk on June 16th, 2014. In January 2015, SanDisk spun NexGen out on its own. In our view, the high-performance capabilities of NexGen's N5 storage system got somewhat lost to the market during the noise of transactions, but the underlying technology remains interesting.



ANALYST CERTIFICATION

I, Richard Kugele hereby certify that the views expressed in this research report accurately reflect my personal views about the subject company (ies) and its (their) securities. I also certify that I, have not been, and will not be receiving direct or indirect compensation in exchange for expressing the specific recommendation(s) in this report.

RATINGS DISTRIBUTIONS FOR NEEDHAM & COMPANY, LLC

	% of companies under coverage with this rating	% for which investment banking services have been provided for in the past 12 months
Strong Buy	5	27
Buy	62	20
Hold	31	5
Underperform	< 1	0
Rating Suspended	< 1	0
Restricted	1	0

Needham & Company, LLC employs a rating system based on the following:

Strong Buy: A security, which at the time the rating is instituted, we expect to outperform the average total return of the broader market as well as the securities in the analyst's coverage universe over the next 12 months.

Buy: A security, which at the time the rating is instituted, we expect to outperform the average total return of the broader market over the next 12 months.

Hold: A security, which at the time the rating is instituted, we expect to perform approximately in line with the average total return of the broader market over the next 12 months.

Underperform: A security, which at the time the rating is instituted, we expect to underperform the average total return of the broader market over the next 12 months.

Rating Suspended: We have suspended the rating and/or price target, if any, for this security, because there is not a sufficient fundamental basis for determining a rating or price target. The previous rating and price target, if any, are no longer in effect and should not be relied upon. This rating also includes the previous designation of "Under Review".

Restricted: Needham & Company, LLC policy and/or applicable law and regulations preclude certain types of communications, including an investment recommendation, during the course of Needham & Company, LLC's engagement in an investment banking transaction and in certain other circumstances.

For disclosure purposes, in accordance with FINRA requirements, please note that our Strong Buy and Buy ratings most closely correspond to a "Buy" recommendation. When combined, 67% of companies under coverage would have a "Buy" rating and 21% have had investment banking services provided within the past 12 months. Hold ratings mostly correspond to a "Hold/Neutral" recommendation; while our Underperform rating closely corresponds to the "Sell" recommendation required by the FINRA.

Our rating system attempts to incorporate industry, company and/or overall market risk and volatility. Consequently, at any given point in time, our investment rating on a security and its implied price appreciation may not correspond to the stated 12-month price target. For valuation methods used to determine our price targets and risks related to our price targets, please contact your Needham & Company, LLC salesperson for a copy of the most recent research report.

Price charts and rating histories for companies under coverage and discussed in this report are available at <http://www.needhamco.com/>. You may also request this information by writing to: Needham & Company, LLC, Attn: Compliance/Research, 445 Park Ave., 3rd Floor, New York, NY 10022

By issuing this research report, each Needham & Company, LLC analyst and associate whose name appears within this report hereby certifies that (i) the recommendations and opinions expressed in the research report accurately reflect the research analyst's and associate's personal views about any and all of the subject securities or issuers discussed herein and (ii) no part of the research analyst's or associate's compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed by the research analyst or associate in the research report.

Disclosures

The research analyst and research associate have received compensation based upon various factors, including quality of research, investor client feedback, and the Firm's overall revenues, which includes investment banking revenues for the following: SanDisk Corp.

The Firm, at the time of publication, makes a market in the subject company SanDisk Corp. .

Equity Options Disclosure

Any Equity Options or Technical Strategy Opinions ("Opinions") contained within this report was prepared by the Equity Options Sales and Trading Desk of Needham & Company, LLC ("Needham" or the "Firm") for distribution to Needham's clients. This Opinion consists of market information and general market commentary only. It is not intended to be an analysis of any security or to provide any information sufficient upon which to base an investment decision.

THIS EQUITY OPTIONS OR TECHNICAL STRATEGY OPINION IS NOT A PRODUCT OF NEEDHAM'S RESEARCH DEPARTMENT AND IS NOT A RESEARCH REPORT. Unless otherwise specifically stated, the information and commentary expressed herein are solely those of the author and may differ from the information, views and analysis expressed by Needham's Research Department or other departments of the Firm or its affiliates.

Needham and its affiliates may have positions (long or short), effect transactions or make a market in the securities or financial instruments referenced in this Opinion. Needham or its affiliates may engage in securities transactions that are not consistent with the information and commentary expressed in this Opinion. Needham may have provided investment banking or other services to the issuers mentioned herein and may solicit such services in the future.

If this Opinion includes extracts or summary material derived from research reports produced by Needham's Research Department, you are directed to the most recent research report for further details, including analyst certifications and other important disclosures. Copies of such reports may be obtained from your Needham sales representative or at www.needhamco.com

This material is provided for informational purposes only and is not intended as a recommendation or an offer or solicitation for the purchase or sale of any security or financial instrument. Any investment decision by you should be based on your specific investment objectives and financial situation. Please contact your Needham sales representative for specific guidance.

The information contained in this Opinion has been obtained from or is based upon sources believed to be reliable, but neither Needham nor the author makes any representation or warranty as to its accuracy or completeness. The information contained in this Opinion is as of the date specified herein. Needham does not undertake any obligation to monitor or update the information. Past performance is not indicative of future results and no representation or warranty, express or implied, is made with respect to future performance. Needham disclaims all liability for any loss that may arise (whether direct or consequential) from any use of the information contained in this Opinion.

Structured securities, options, futures and other derivatives are complex instruments, may involve a high degree of risk, and may be appropriate investments only for sophisticated investors who are capable of understanding and assuming the risks involved. Because of the importance of tax considerations to many options transactions, any investor considering the purchase or sale of any options contract should consult with his or her tax advisor as to how taxes affect the outcome of contemplated transactions. Needham and its affiliates do not provide tax advice.

OPTIONS ARE NOT SUITABLE FOR ALL INVESTORS. For further information on the risks associated therewith, please consult the Options Clearing Corporation's options risk disclosure document available at the following web address: <http://www.optionsclearing.com/about/publications/character-risks.jsp>

Clients should call the Equity Options Sales and Trading Desk (212-705-0369) for additional information.

Additional Disclosures for Israeli Clients

All information presented in this document is, unless otherwise specified, under copyright of Needham & Company, LLC ("Needham"). No part of this publication may be copied or redistributed to other persons or companies without the prior written consent of Needham. These reports have been prepared by Needham and distributed by Clal Finance Batucha Brokerage, Ltd. ("Clal"), which accepts sole responsibility for its content subject to the terms set forth below.

Neither Clal or its affiliates (and any director, officer or employee thereof) nor Needham is liable for any incomplete or improper transmission of these reports or for any delay in transmission. Any unauthorized use, disclosure, copying, distribution, or taking of any action in reliance on these reports is strictly prohibited. The views and expressions in the reports are expressions of opinion and are given in good faith, but are subject to change without notice. These reports may not be reproduced in whole or in part or passed to third parties without permission. Clal or its affiliates (and any director, officer or employee thereof) and Needham do not guarantee their accuracy or completeness, and neither Clal or its affiliates (and any director, officer or employee thereof) nor Needham shall be liable in respect of any errors or omissions or for any losses or consequential losses arising from such errors or omissions.

Neither the information contained in these reports nor any opinion expressed constitutes an offer, or an invitation to make an offer, to buy or sell any securities or any options, futures or other derivatives related to such securities ("related investments"). Clal or its affiliates (and any director, officer or employee thereof) and Needham may trade for their own accounts as odd-lot dealer, market maker, block positioner, specialist and/or arbitrageur in any securities of the issuer or in related investments, and may be on the opposite side of public orders. Clal or its affiliates (and any director, officer or employee thereof) and/or Needham may have a long or short position in any securities of the issuer or in related investments. Clal or its affiliates (and any director, officer or employee thereof) and/or Needham may from time to time perform investment banking or other services for, or solicit investment banking or other business from, any entity mentioned in these reports.

These reports are prepared in general for the Israeli clients of Clal who are qualified institutional customers as defined by reference to the First Schedule to the Securities Law, 1968, of the State of Israel. They do not have regard to the specific investment objectives, financial situation and the particular needs of any specific person who may receive any of these reports. Investors should seek financial advice regarding the appropriateness of investing in any securities or investment strategies discussed or recommended in these reports and should understand that statements regarding future prospects may not be realized. Investors should note that income from such securities, if any, may fluctuate and that each security's price or value may rise or fall. Accordingly, investors may receive back less than originally invested. Past performance is not necessarily an indication of future performance.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or related investment mentioned in these reports. In addition, investors in securities such as ADRs, whose value are influenced by the currency of the underlying security, effectively assume currency risk. Unless agreed in writing with Clal, this research is intended solely for use internally by the recipient.

Needham is not an authorized broker, dealer or investment adviser outside the United States. The research does not constitute an offer to provide financial services to anyone outside the United States. Any investor in Israel wishing to buy or sell the securities mentioned in this report should do so through Clal.

Neither Needham, the research analyst nor anyone else acting on behalf of Needham is an Israeli investment advisor, investment marketer or portfolio licensed under the Israeli Regulation of Investment Advice, Investment Marketing and Investment Portfolio Management law, 1995. Accordingly, Needham does not maintain the insurance specifically required of a licensee in accordance with such law.

This report is for informational purposes only and does not constitute a solicitation or an offer to buy or sell any securities mentioned herein. Information contained in this report has been obtained from sources believed to be reliable, but Needham & Company, LLC makes no representation as to its accuracy or completeness, except with respect to the Disclosure Section of the report. Any opinions expressed herein reflect our judgment as of the date of the materials and are subject to change without notice. The securities discussed in this report may not be suitable for all investors and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. Investors must make their own investment decisions based on their financial situations and investment objectives. The value of income from your investment may vary because of changes in interest rates, changes in the financial and operational conditions of the companies and other

factors. Investors should be aware that the market price of securities discussed in this report may be volatile. Due to industry, company and overall market risk and volatility, at the securities current price, our investment rating may not correspond to the stated price target. Additional information regarding the securities mentioned in this report is available upon request.

© Copyright 2016, Needham & Company, LLC, Member FINRA, SIPC.