Security Virtualization within the Next Generation Data Center

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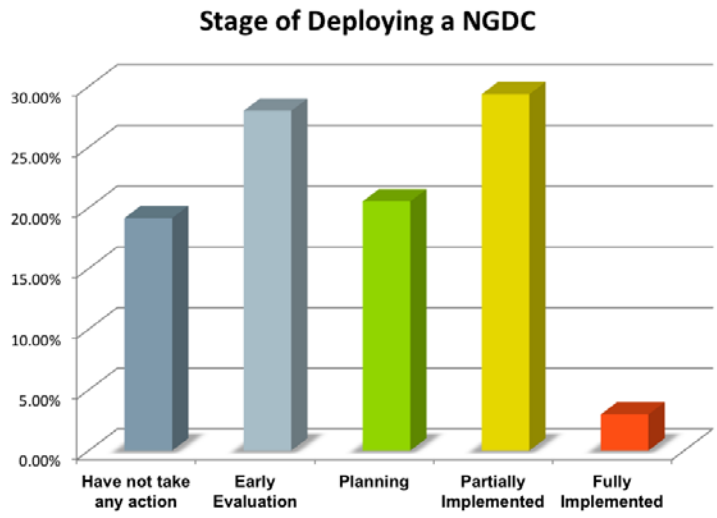
About this Research Note

In December 2011, Crossbeam conducted a survey to understand how security infrastructure will evolve as organizations move to a Next Generation Data Center (NGDC) architecture that relies heavily on virtualization. The results of this survey show that over 64% of respondents feel that virtual servers or the private cloud is only one component of the NGDC, and that over 78% of respondents are in some phase of planning and implementation of a NGDC. However, only 3% claim to have a fully implemented NGDC. See Table 1.

These results prompted Crossbeam to issue a more in-depth survey in February 2012 to understand the extent to which IT organizations are leveraging virtualization technology to create the dynamic and highly flexible environment of the NGDC, and what factors are challenging or slowing the progress. This research note will focus on the results of the February survey to provide a deeper understanding of how organizations are transitioning traditional data centers to the NGDC model.



KEY FINDINGS

1. The respondents indicate that virtualization technology will be used throughout the Next Generation Data Center (NGDC), with the largest focus on application servers, storage and network security. Switches and routers will have considerably less of a focus.

2. Regardless of position within the organization, respondents agree upon the amount of virtualization that should be applied within the NGDC

3. Comparing the current level of virtualization to the desired future level of virtualization, network security shows the largest gap of 41% between vision and reality, as compared to application servers which only have a gap of 26%.

4. Vice presidents feel that the current state of their data center is closer to achieving their target virtualization goals for the NGDC than managers by 18%. Vice presidents think they are further ahead in achieving virtualized network security for the NGDC than managers by over 30%.

5. The amount of virtualization applied to application servers, switches and routers will continue to grow, where no growth will occur for storage and network security.

6. Overall progression toward the virtualization goals of the NGDC will grow by less than 1% over the next 12 to 18 months.

7. 94% of respondents cite network security as the top reason why NGDC deployments are stalled, with virtually no progress anticipated in the next 12 to 18 months.

8. More than 41% of respondents say that network security is the biggest obstacle to the successful deployment of NGDCs. This is compared to storage and application servers, which received a mere 15% and 14% respectively.

9. Overall network security expertise is viewed as the second biggest contributing factor slowing NGDC deployments behind budgetary restraints, with executives viewing the lack of expertise as the top factor.

10. The difference of opinion between executives and front-line workers regarding budget restrictions slowing NGDC deployments could be attributed to differing views on how close they are to achieving NGDC goals, as mentioned above in key finding #4.

PURPOSE OF THE STUDY

This survey was conducted in order to understand the industry perspective of the NGDC, how technologies will be virtualized within it, and the importance of transitioning from the traditional data center to the NGDC. Crossbeam surveyed information technology (IT) professionals to understand their vision of NGDC architecture and to determine how their organization is aligned to meet this vision today and in the next 12 to 18 months. The survey was designed to delineate between different organizational roles to understand the viewpoint of vice presidents, directors, managers, architects, engineers, analysts and technicians. The survey went on to determine which technology areas are inhibiting the transition to the NGDC and which factors are slowing the progress.

METHODOLOGY

A majority of questions used a Likert Scale to allow respondents to choose their level of agreement or disagreement. If a Likert Scale could not be applied, other question formats were used.

DESCRIPTION OF SAMPLE

The survey sample was sent to over 60,000 Crossbeam contacts and customers who hold positions within IT organizations as executives, managers, architects, engineers, analysts or technicians. This database of contacts is consistently updated and validated.

ANALYSIS OF THE DATA

The data analyses employed in this study primarily included descriptive statistics (i.e., frequencies, means, medians, ranges, etc.). Percentages were generally based on the number of responses to each survey item, thus omitting missing data. In some instances, total percentages do not equal 100 because of rounding during the analysis process or respondents having the ability to choose more than one option.

LIMITATIONS OF THE STUDY

No survey protocol can ensure adequate representation from all targeted groups. In the case of electronically conducted surveys, responses are collected on a voluntary basis and may not be consistent of all environments or organizations. We have taken steps to verify the validity of the sample to provide a statistically sound representation.

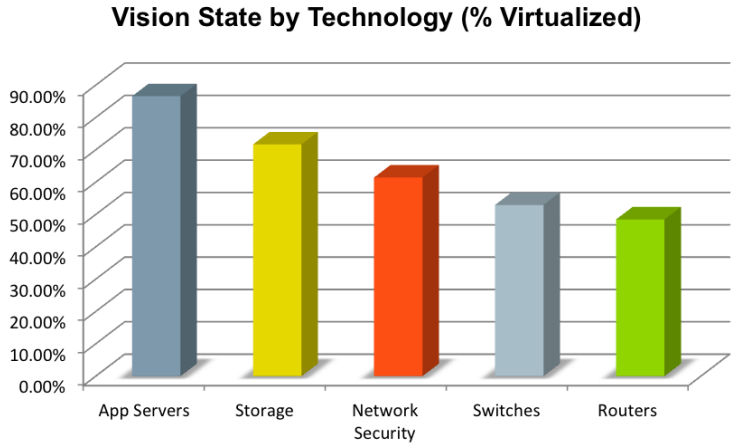
FINDINGS

The survey returned 529 use cases. Missing or non-valid responses were not used to determine results of each table.

VISION OF THE NEXT GENERATION DATA CENTER

Respondents reveal that virtualization should be applied to all technology areas of the Next Generation Data Center, as seen in Table 2. However, the average degree of virtualization varies by each technology, with application servers (86.57%), storage (71.66%) and network security (61.44%) cited as the the top areas when compared to switches (52.95%) and routers (48.46%).

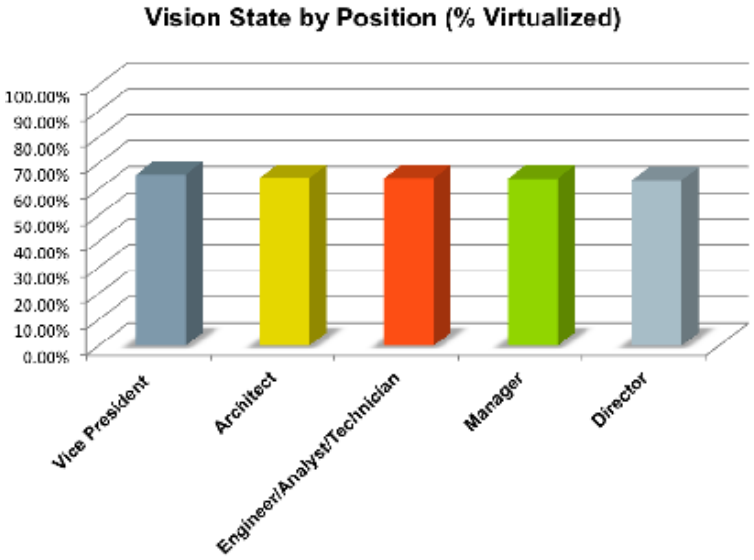
Table 2: N = 508



It is clear from the findings that respondents feel the NGDC needs to leverage virtualization in other areas besides the server infrastructure, in essence extending the private cloud to include storage and network security.

Further examination shows (Table 3) little variance between organizational roles regarding how much the NGDC should be virtualized. Vice presidents (65.56%), directors (63.47%), managers (64.11%), architects (64.33%) and engineers (64.21%) are all in alignment. The high equaled 65.56% and the low equaled 64.11% or a 1.45% variance.

Table 3: N = 508

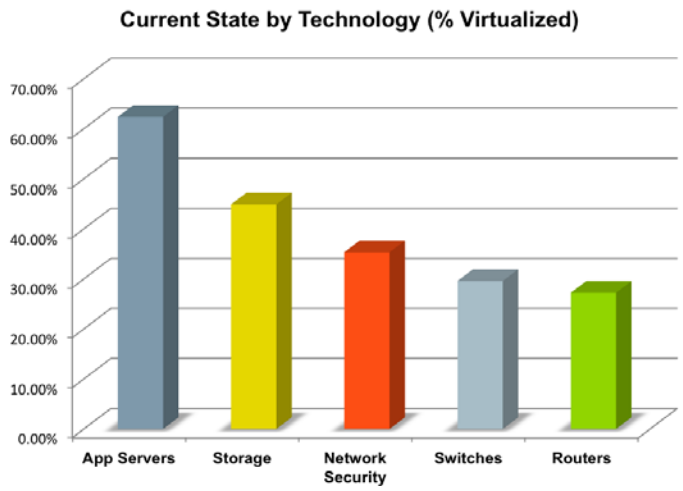


This information shows that the overall goal of virtualizing the NGDC is agreed upon throughout the organizational hierarchy.

CURRENT STATE OF THE DATA CENTER

The survey sought to gauge the gap that exists between the current state of the data center and future vision for the NGDC. When asked about the current stage of virtualization (Table 4), respondents indicate that application servers (62.38%) and storage (44.89%) significantly exceed that of network security (35.33%), switches (29.60%) and routers (27.23%).

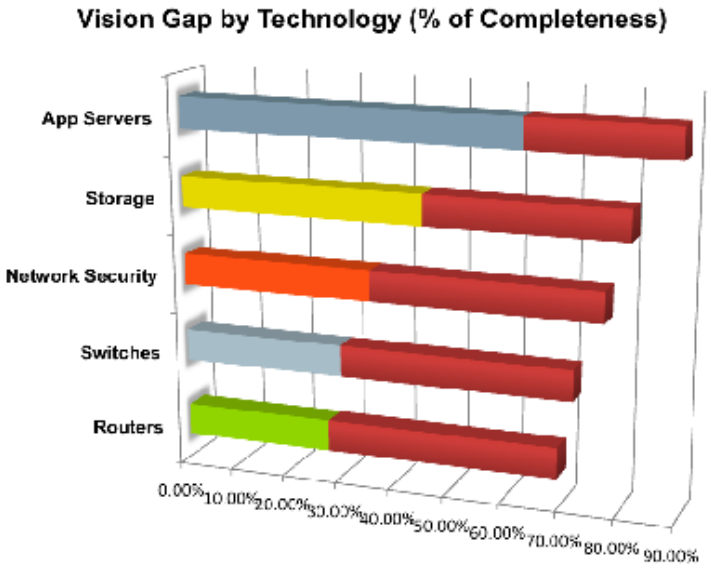
Table 4: N = 504



When comparing the current state of the NGDC to the level of virtualization respondents indicate they'd like to achieve to meet their vision for the NGDC, findings show that the virtualization of application servers and storage infrastructure is much further along, as shown in Table 5. Applications servers are 62.38% complete toward reaching the NGDC vision, compared to storage at 44.89%, network security at 35.33%, routers at 27.23% and switches at 29.60%.

Comparing current state to vision, Table 5 reveals that switches (42.03%), routers (41.84%) and network security (41.44%), have a further gap between current state and vision than storage (36.07%) and application servers (26.74%). This gap, which is indicated by the red bar in the graph, show how much more virtualization needs to be implemented to reach the vision goal.

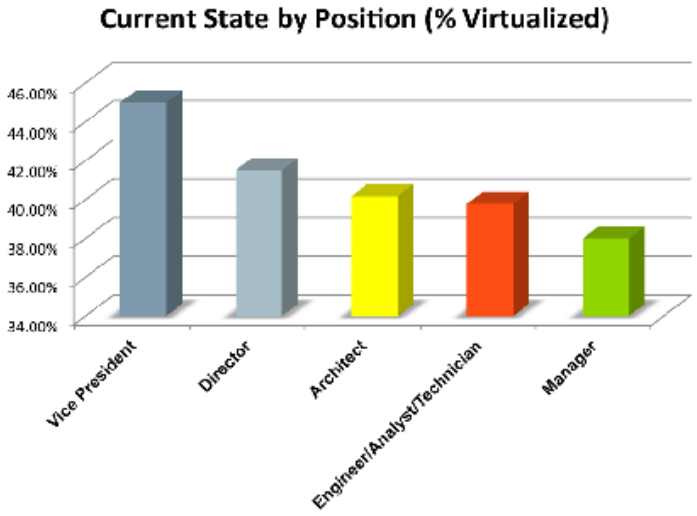
Table 5: N = 504



When comparing the current to the desired state of the NGDC, on average organizations have only realized 62% of their vision. Virtualizing network security shows the largest vision gap of the top areas, identified in Table 2, where virtualization needs to grow by more than 41%, which is more than double that of servers.

Segmenting the data by position reveals (Table 6) that executives, including vice presidents (45.00%) and directors (41.51%), think the current state of their data center is much closer to reaching their vision for the NGDC than other positions, including managers (37.99%), architects (40.17%) and engineers (39.79%).

Table 6: N = 504

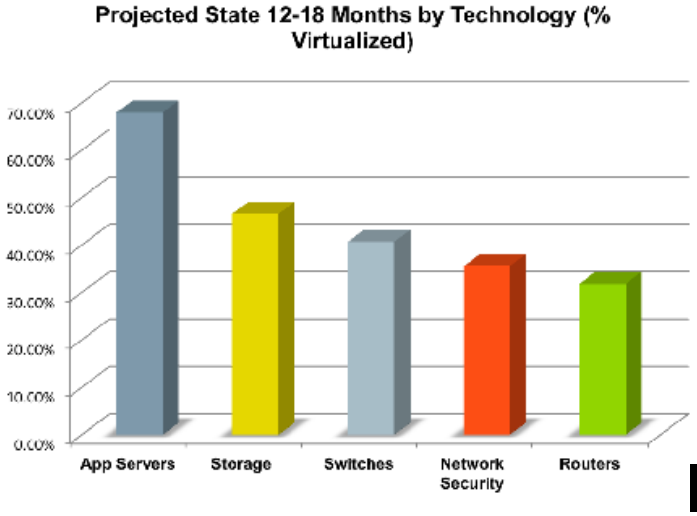


The difference in perception between IT executives and front-line workers in terms of how far along they are in reaching their goals for the NGDC could be one of the causes for another difference of opinion between these groups regarding what factors are slowing NGDC efforts and, therefore, what resources may be required to move these efforts forward, as discussed later under Table 10.

PREDICTING THE STATE OF THE DATA CENTER IN 12 TO 18 MONTHS

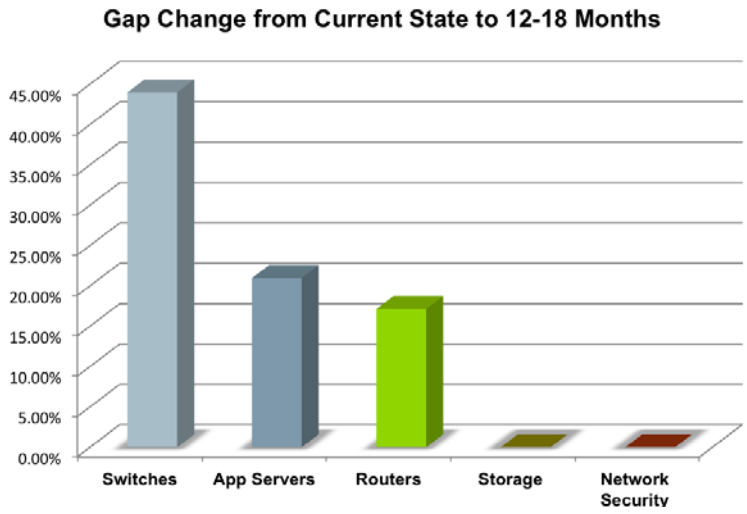
Respondents were asked to predict where the data center would be in terms of reaching their predefined NGDC vision. Respondents indicate that in 12 to 18 months, the percentage of virtualization for each technology area would reach 67.94% for application servers, 46.58% for storage, 40.70% for switches, 35.57% for network security and 31.87% for routers, as seen in Table 7. be in regards to reaching the predefined NGDC vision. The respondents indicated that in 12-18 month the percentage of virtualization for each technology area would reach 79.05% for application servers, 67.97% for storage, 55.83% for switches, 57.90% for network security and 52.55% for routers as seen in Table 7.

Table 7: N = 500



If we compare this predicted growth to the current state the amount of growth is apparent with switches showing the highest percentage of growth (43.97%) then followed by application servers (20.95%) and routers (17.13%). Table 8 shows storage and network security are predicted to make zero gains in the next 12 to 18 months towards reaching the virtualization vision.

Table 8: N = 500

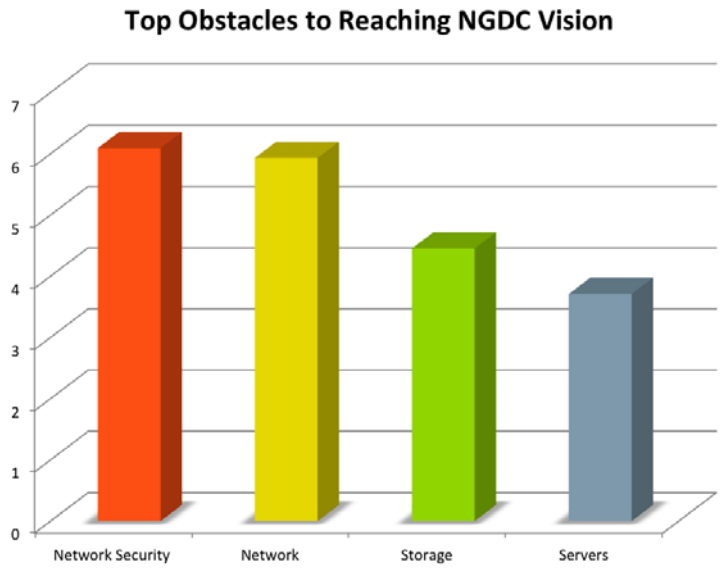


This lack of advancement for storage and network security impacts the overall growth of moving toward the NGDC vision. The overall percentage of reaching the NGDC vision in 12 to 18 month is 62.66%. Compared to the current state of 62.37% this equals less than a 1% overall improvement.

OBSTACLES IN REACHING THE NGDC VISION

When asked, "Which technical area will be the biggest obstacle to the deployment of NGDCs", the respondents identified network security as the largest obstacle with a mean score of 6.09, followed by the network infrastructure with a score of 5.93, then storage score of 4.45 and a server score of 3.71 as shown in Table 9.

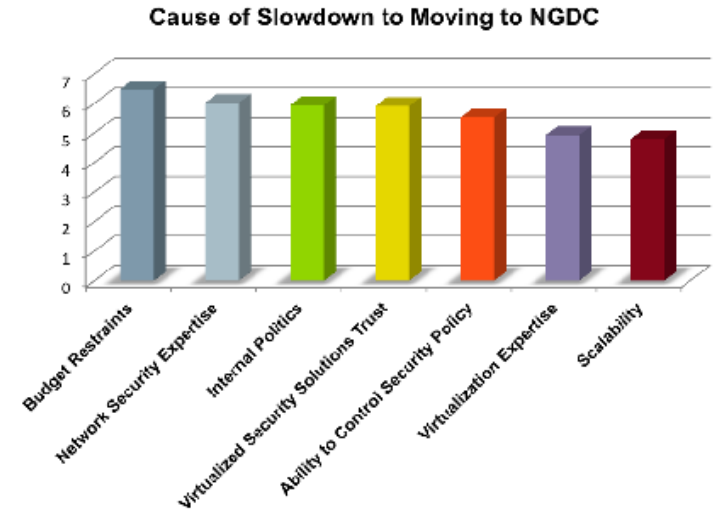
Table 9: N = 504



When examining the business challenges to moving to a NGDC, lack of network security expertise was viewed as the top reason as shown in Table 10, besides the normal budgetary challenges found in any organization. The potential causes ranked as follows:

1. Budget restrictions: 6.47
2. Lack of security expertise: 6.02
3. Internal politics: 5.94
4. Trust in virtualized security solution: 5.91
5. Ability to control security policy: 5.53
6. Lack of virtualization expertise: 4.92
7. Scalability: 4.79

Table 10: N = 504



When comparing executives, including Vice Presidents and Directors, they ranked lack of network expertise as the top-contributing factor, Table 11. Further investigation between executives and front line team members, including managers, architects and engineers, revealed a misalignment between how budgetary restraints were perceived as a reason for slowing progress towards the NGDC. Executives ranked budgetary restraints as the second most important factor where frontline personnel ranked it as the top. Table 12.

Table 11: N = 52

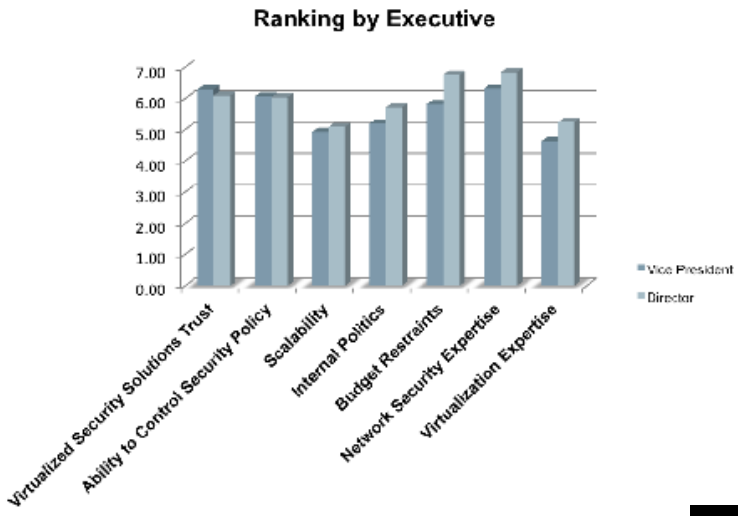
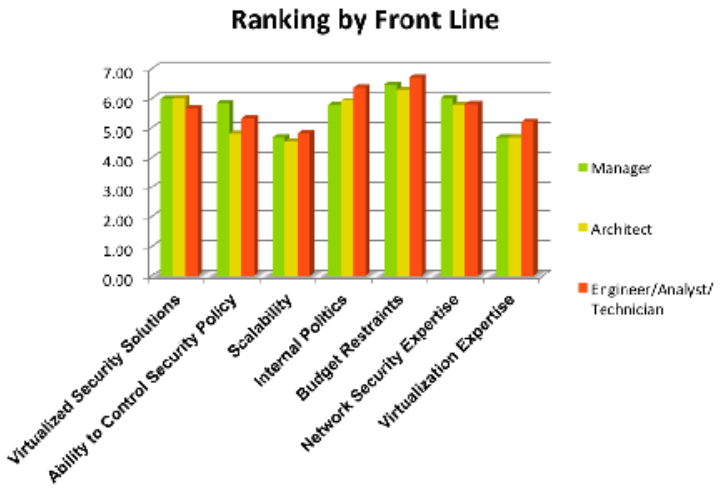


Table 12: N = 452



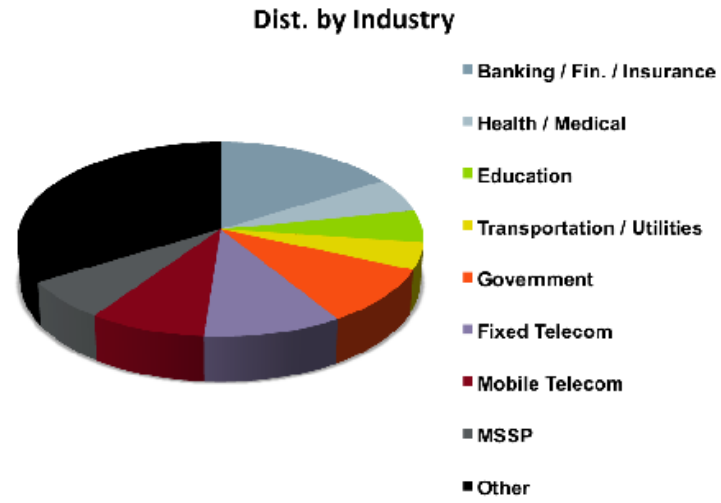
This misalignment may be related to executives feeling they are closer to reaching their NGDC vision than the front line team members, therefore assuming they have enough resources in place to reach their goals.

DESCRIPTION OF SURVEY PARTICIPANTS AND THEIR INDUSTRIES

Respondents hold IT positions in the following industries, as shown in Table 13:

- Banking / Financial /Insurance: 16.1%
- Health / Medical: 5.7%
- Education: 5.3%
- Transportation / Utilities: 4.5%
- Government: 9.5%
- Fixed Telecommunications: 10.0%
- Mobile Telecommunications: 8.5%
- Managed Security Service Provider: 6.6%
- Other: 33.6%

Table 13: N = 528



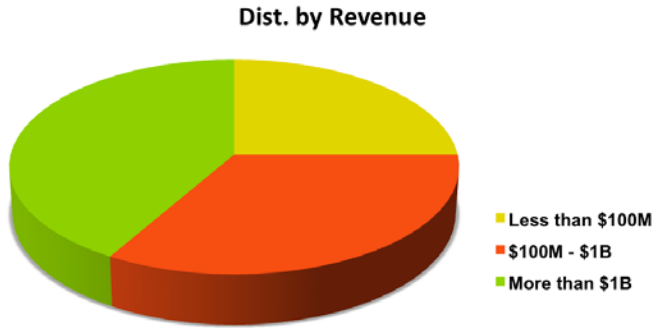
Research by industry showed no statistically different results from the total analysis except for transportation and utilities that showed virtualization within the NGDC to lower than other industries.

DEMOGRAPHICS OF RESPONDENTS

Respondents are distributed by revenue, Table 14:

- Less than $100M: 25%
- $100M - $1B: 33.33%
- More than $1B: 41.67%

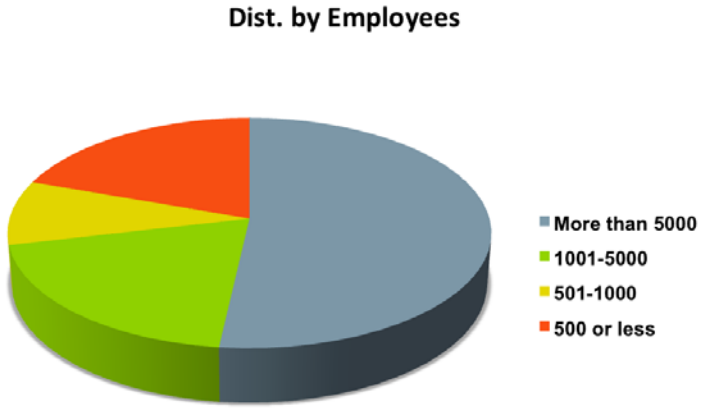
Table 14: N = 504



Respondents are distributed by revenue, Table 15:

- More than 5000: 51.78%
- 1001-5000: 19.57%
- 501-1000: 9.09%
- 500 or less: 19.57%

Table 15: N = 506



SUMMARY

In summary, the respondents indicate a number of interesting metrics that highlight their vision for the NGDC and have drawn comparisons between the state of the data center today and the projected state of the data center in 12 to 18 months. All though many factors have implications to reaching the vision the top factors to reach the goal revolve around skill sets and budgetary restraints.

CONCLUSION

With application servers, storage and network security being ranked as the top areas of focus to apply virtualization it is apparent that application servers have been the key area of focus up to today in actually applying virtualization. Respondents have indicated that they view extending virtualization or the private cloud to the storage and network infrastructure as a key focus area, but have made little progress in moving towards their virtualization goal. This combined with the view that network security is the biggest obstacle and lack of network security expertise is the biggest contributing factor the data leads to make the conclusion that organization have a lack of knowledge and/or are not familiar with solution that leverage virtualization for network security. To rectify this condition organization may need to look towards vendors and solutions that leverage virtualization technology with consulting services to help provide guidance as to how most effectively plan and implement network security in the NGDC.

This type of vendor would enable the organization to progress towards and reach their virtualization goal by providing expertise that organizations may not have internally.