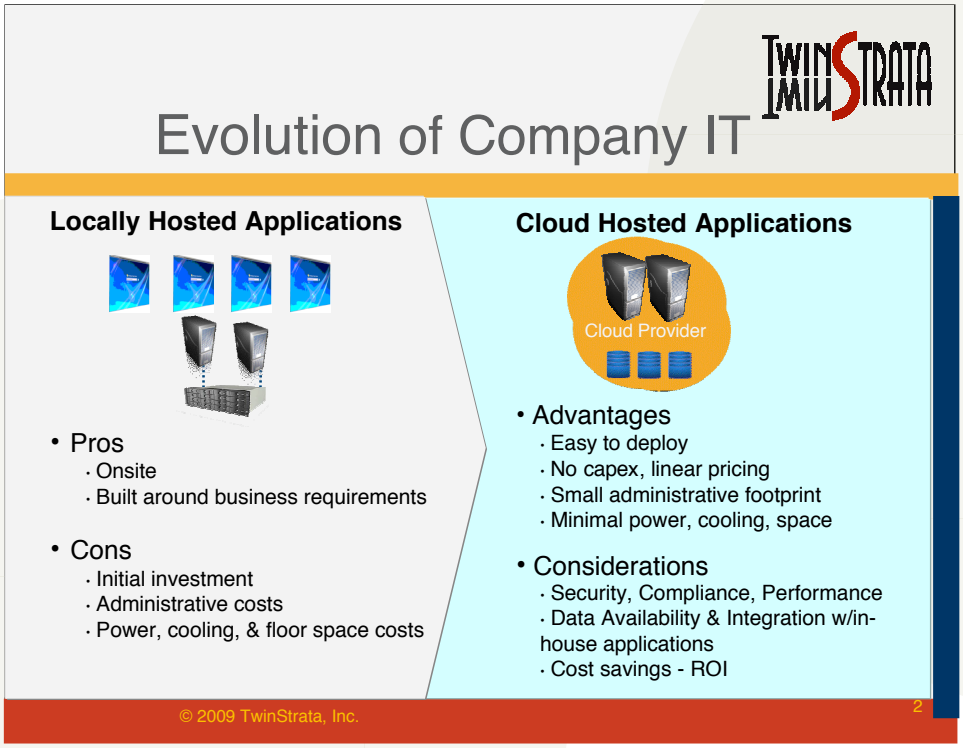
Google® Apps
vs.
Microsoft® Apps

Cost/risk analysis using Clarity AP™ software

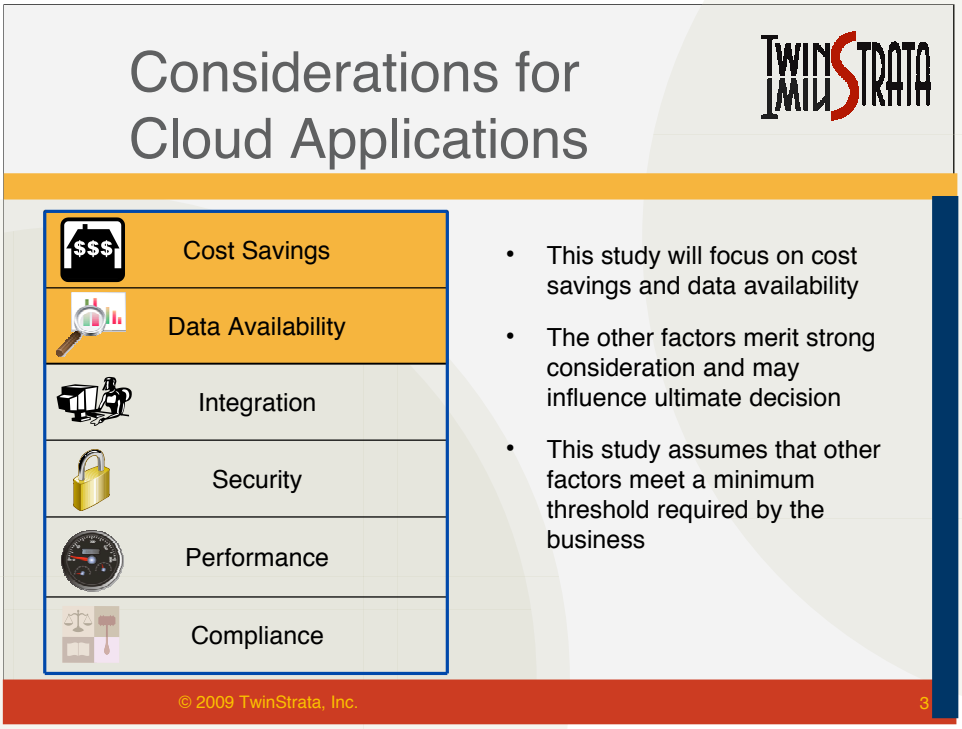
(20-user organization)



While many businesses may already be considering utilizing cloud services today, I wanted to provide a brief context around the drivers of cloud-based services. Until recently, local servers, software and infrastructure were the only choice for deploying applications across an enterprise. With many small businesses unable to afford the initial capital investment and the administrative, power, cooling and floor space costs that come with growing their IT infrastructure, cloud services are being viewed as an attractive alternative by smaller, more nimble businesses.

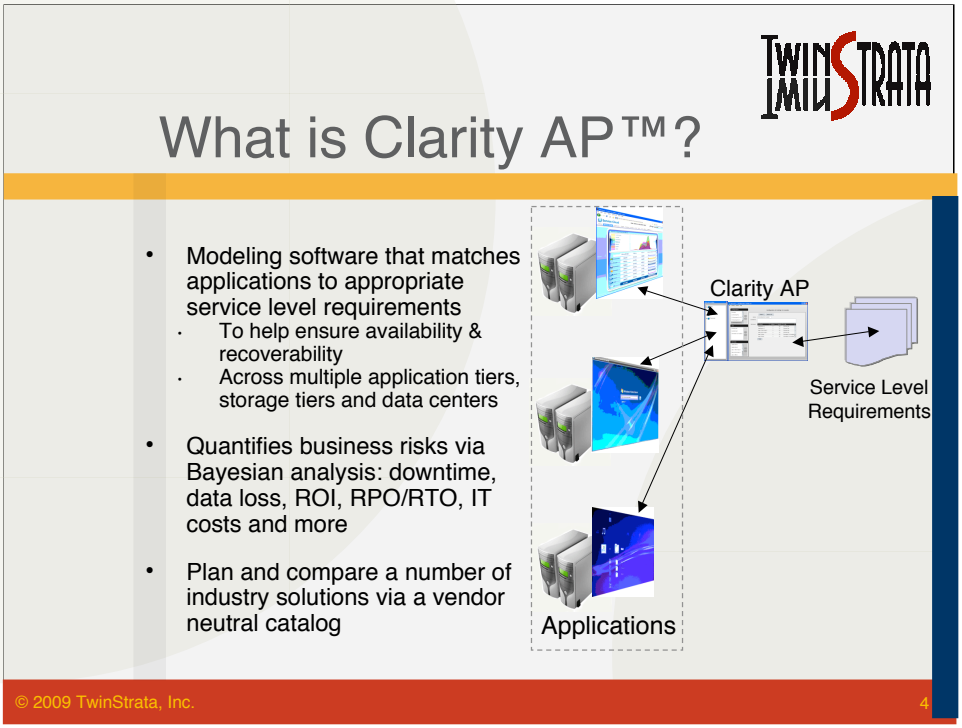
Given the current economic downturn, cloud services are gaining in appeal for many larger businesses. Cloud services eliminate capital expenses, replacing them with linear pricing and growth. Cloud services virtually eliminate the local administration footprint, with software or media to manage --- reductions in power, cooling and space can be substantial. A multi-terabyte or even petabyte infrastructure no longer means enormous and growing lab budgets.

However, a number of considerations should be take into account before choosing to deploy cloud services.



Some factors and questions you may want to consider when compare online applications to cloud applications include:
Cost savings – can I save capital and operating expense from moving to the cloud? Will I gain efficiencies due to economies of scale of cloud providers?
Availability – can the availability of cloud storage match that of my internal infrastructure?
Integration – how can I move my existing applications and data to utilize cloud services and will there be a significant development effort?
Security – can I trust my data offsite or with an external provider?
Performance – will my applications perform as well as they do today?
Compliance – will cloud applications introduce any complications around regulatory compliance, including retention policies? Will it augment my compliance capabilities?

This analysis focuses on assessing cost savings and application availability. Other factors, which merit a strong consideration, may ultimately influence the decision to stay local or move to cloud-hosted applications. For this study, we assume the other factors meet the minimum threshold required by a business.



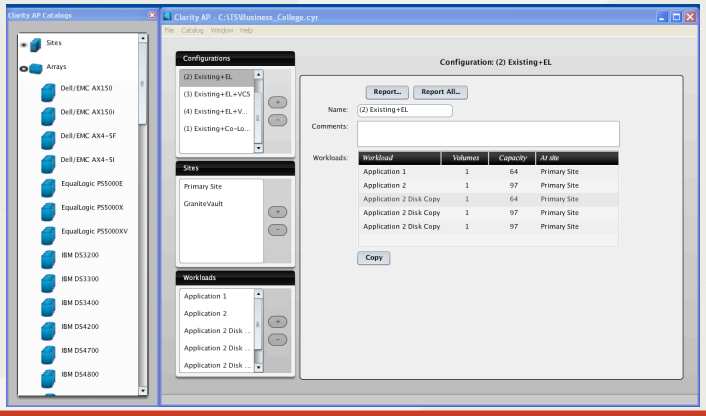
Clarity AP is the analysis tool we are using for our analysis, which is software that helps match applications and storage to the appropriate service level requirements to help ensure availability and recovery across multiple application tiers, storage tiers and even data centers

Clarity AP quantifies business risks via a Bayesian analysis that calculates:
-Risk of downtime
-Risk of data loss
-Ability to meet recovery objectives
-Capital and operational costs
-A simple ROI model that takes into the account al of the above factors

What is perhaps most interesting about Clarity AP is the ability to model a number of what-if scenarios against existing configurations, simply by dragging and dropping solution components from our catalog. It then provides comparative metrics across the scenarios to make the optimal IT decisions to meet business needs.

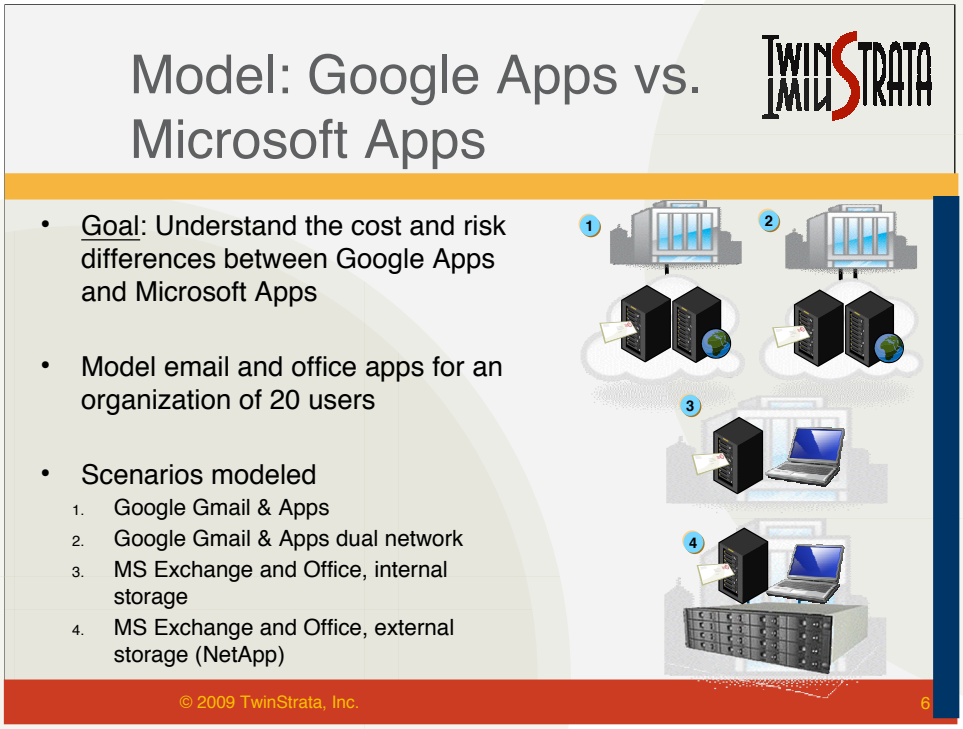
What does Clarity AP Model?

- Extensive, expandable drag-and-drop catalog of both local and cloud applications and infrastructure



Clarity AP uses a component catalog with over 100 industry components and solutions that span both local onsite and cloud-hosted applications and infrastructure. These components and solutions are from a well-known list of vendors, many of which you see here. They are modeled based on specs, empirical performance and street prices.

The catalog is easily expandable to include many more components and allows users to adjust component values based on experience and even do a sensitivity analysis of component values. A drag-and-drop interface makes it simple to add components to a configuration as a part of a "what-if" scenario.

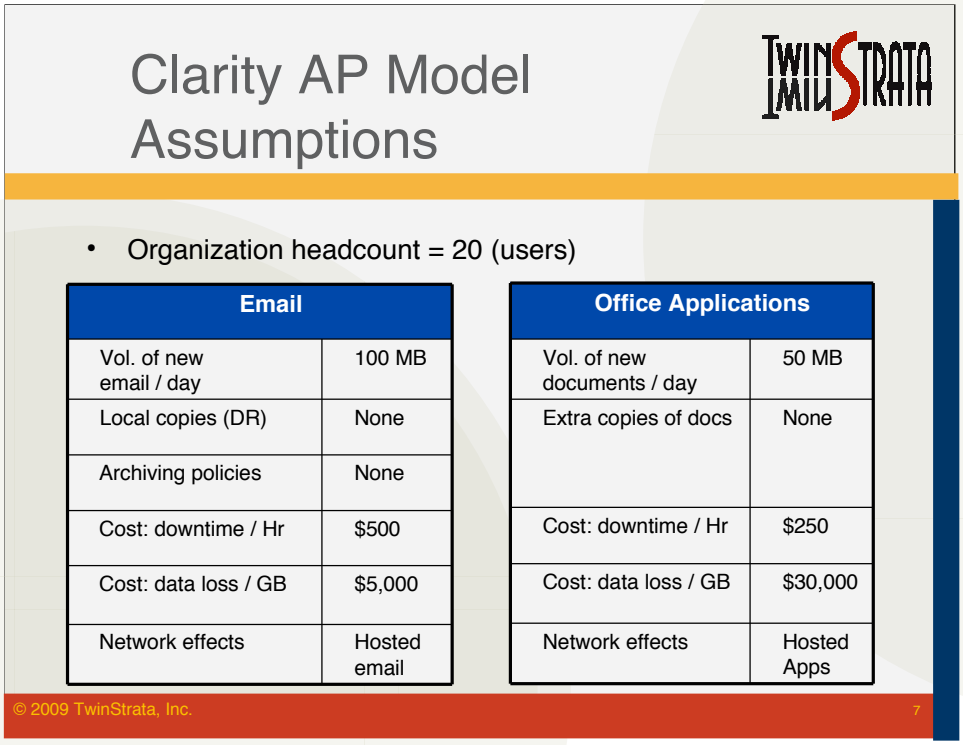


Let's go ahead with our analysis: Google Apps versus Microsoft Apps. We will construct a model for a decision that a variety of business may be considering today or would like to better understand.

Our goal with the model we create is to understand the cost and risk differences between Gmail & Google Apps and MS Exchange and Office for a 20 employee business.

For this example, we are modeling email and office applications under 4 distinct scenarios:

- First, running Gmail and Google Apps
- Second, running Gmail and Google Apps with two separate network from the main site to mitigate risk of network outage
- Third, running Microsoft Exchange on a server with internal storage and Microsoft Office with files residing on PC local disk
- Finally, running Microsoft Exchange and Microsoft Office with data residing on a NAS storage system



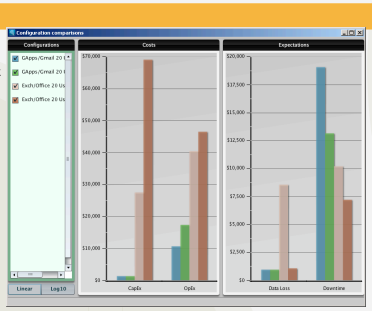
Every Clarity AP assessment begins with a business impact analysis (BIA). For this example we are modeling a 50-employee organization with the following parameters and risk factors:

For email:
-We assume a change rate of 100MB of new email per day
-We assume no extra copies of email are kept outside of the server for DR purposes or archiving
-For each hour of email downtime, we assume a 50% productivity drop in employees, resulting in approximately $500/hr cost of downtime
-For each GB of email data lost, we assume a 5hr loss of productivity across all employees to recover lost data
-Finally, we assume that an external network outages will result in loss of connectivity for employees to the email server for hosted email and add that risk into our hosted email model

For Office Applications:
-We assume a change rate of 50MB of new office documents per day
-We assume no extra copies of documents are maintained outside of the default workspace for DR purposes or archiving
-For each hour of email downtime, we assume a 25% productivity drop in employees, resulting in an approx. $250/hr cost of downtime
-For each GB of office application data lost, we assume a 3hr loss of productivity to recover each lost document for approx. 500 documents. This results in a $30K/hr cost of downtime
-Finally, we assume that external network outages will result in loss of connectivity for employees to the their office applications for the hosted applications

Clarity AP Results and 3-yr TCO

Google Apps
Google Apps dual network
MS Apps internal storage
MS Apps external storage

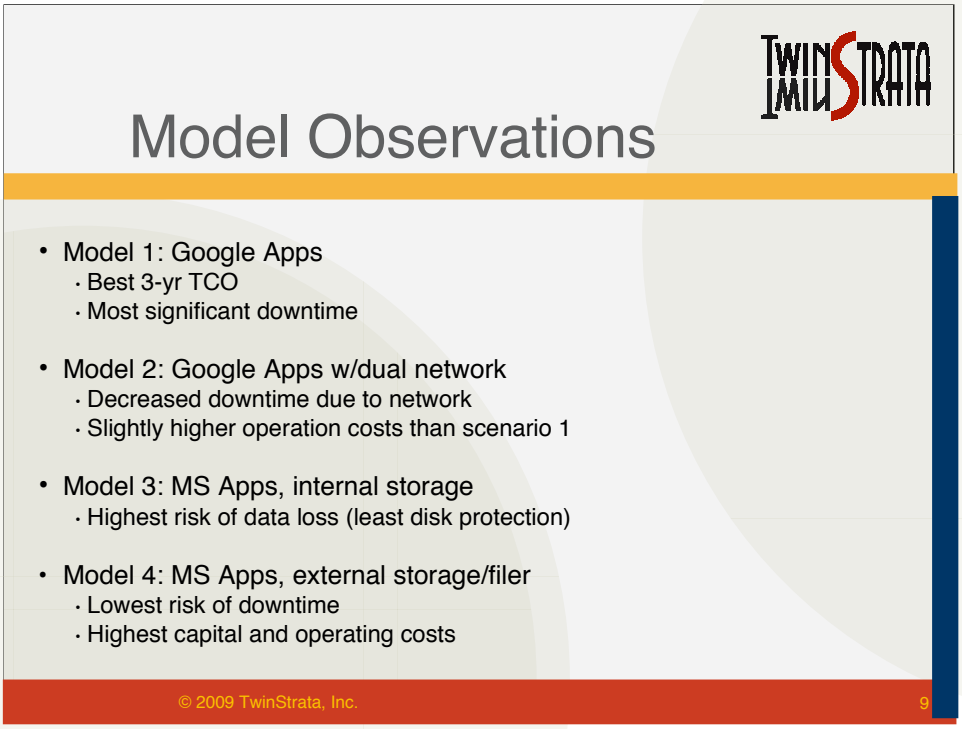


Clarity AP
1-yr Costs

Solution	Capex	Opex	3yr TCO	Annual risk of downtime	Annual risk of data loss	Risk Adjusted 3-yr TCO
Google Apps	$1,353.00	$10,688.00	$33,417.00	$19,077.16	$957.97	$93,522.39
Google Apps dual network	$1,353.00	$17,388.00	$53,517.00	$13,157.62	$958.90	$95,866.56
MS Apps internal storage	$27,529.00	$40,473.44	$148,949.32	$10,211.19	$8,563.93	$205,274.68
MS Apps external storage	$69,129.00	$46,548.25	$208,773.75	$7,217.21	$1,077.89	$233,659.05

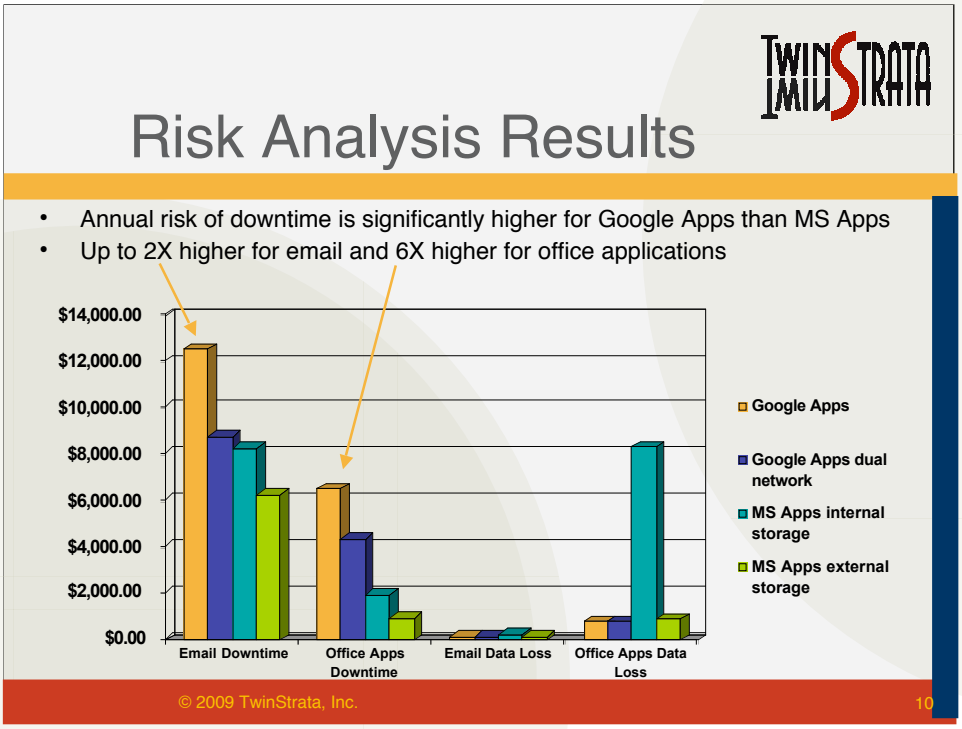
What is more interesting is the 3-yr TCO calculated by Clarity AP that includes annual expected costs of down time and data loss.

Note that due to the higher risk of downtime of the Google Apps solution the results start to get marginally closer – particularly the Microsoft external storage configuration which has a significantly lower risk of downtime than the other solutions.



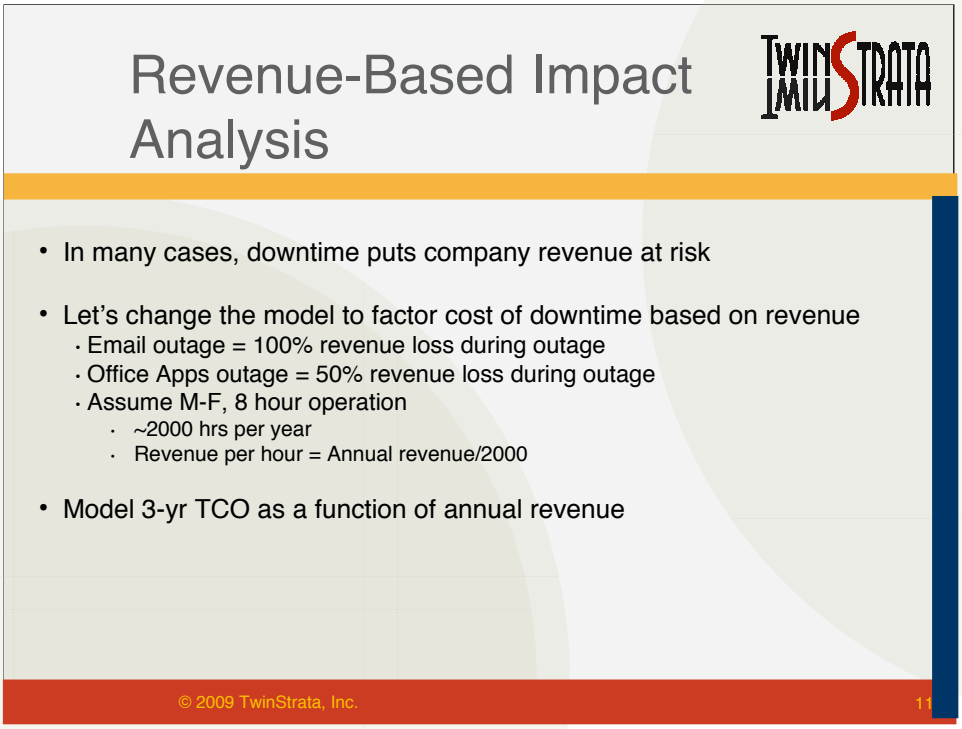
For this example, we make the following observations:

1) Scenario 1, Google Apps has the best adjusted 3-yr TCO
2) Not far behind is scenario 2, where the network effects of Google Apps are minimized by adding a 2nd network
3) Scenario 3 has the highest risk of data loss and higher capital and operating costs
4) Finally, scenario 4, which has the lowest risk of down time, comes in 4th due to the high capital and operational costs.



One important take-away from this analysis is that the risk of downtime is significantly higher for Google Apps- up to 2X higher for email and 6X higher for office applications.

As a result, the business impact analysis can significantly change the results and TCO of the solutions if impact of downtime were to increase due to:
-Factoring in potential revenue loss in addition to employee productivity loss
-Other increased business criticality of the applications (due to other factors such as missed deadlines, meetings, etc)

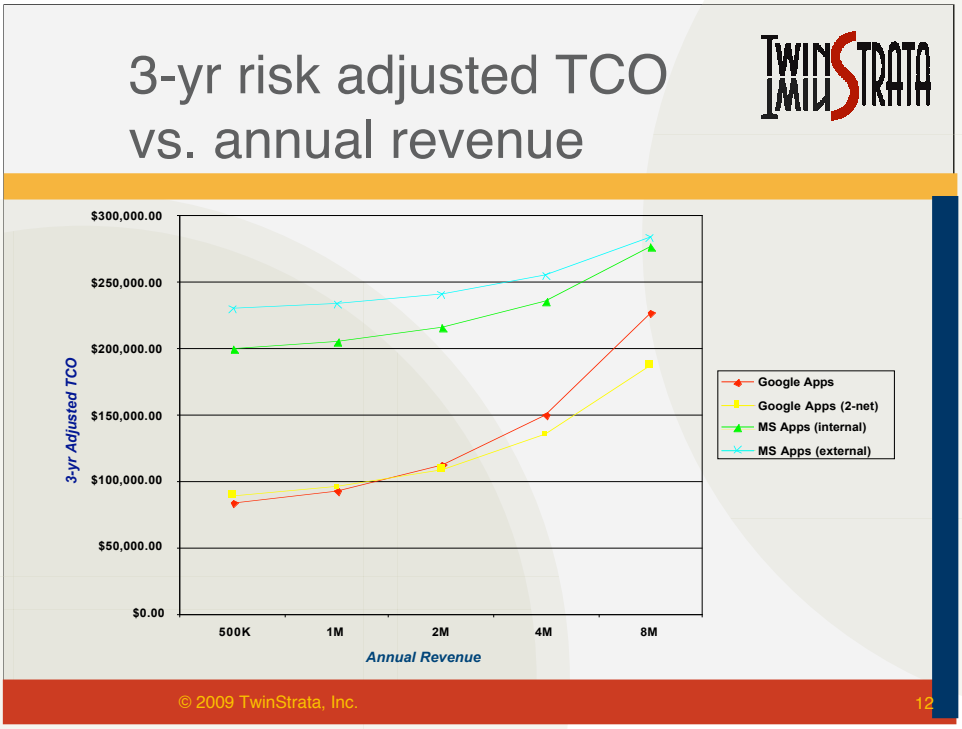


Now let's change the model to factor cost of downtime based on revenue

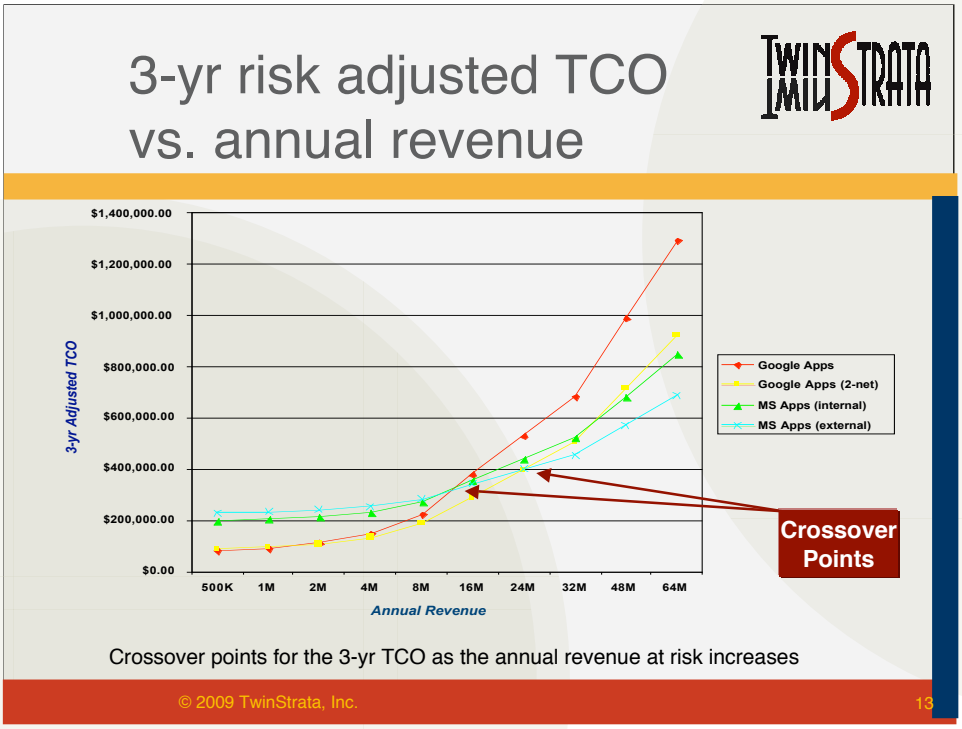
Assume the business operates M-F, 8 hrs per day

- Assume an email outage results in 100% revenue during the outage
- Assume an office apps results in 50% of revenue during the outage
- With approximately 2000 business hours per year, revenue per hour = Annual revenue/2000

Now we can model 3-yr risk-adjusted TCO as a function of annual revenue

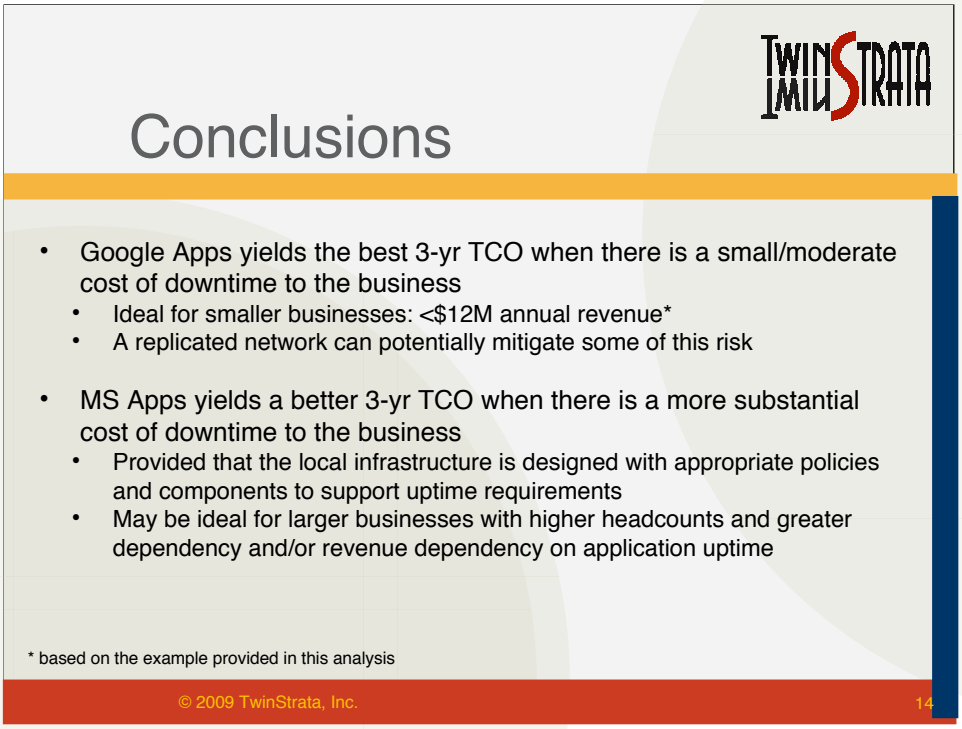


For smaller annual revenues of $8M or less, there is a significant advantage to Google Apps in risk adjusted TCO



As the annual revenue increases, we can see a crossover points on this graph where 3-yr risk-adjusted TCO for the MS solution dips below the Google Apps solution.

Note, the MS Apps external solution has a better risk-adjusted TCO than the Google Apps single-net solution once annual revenue exceeds $12M and a better risk-adjusted TCO than the dual-net solution once annual revenue exceeds $24M.

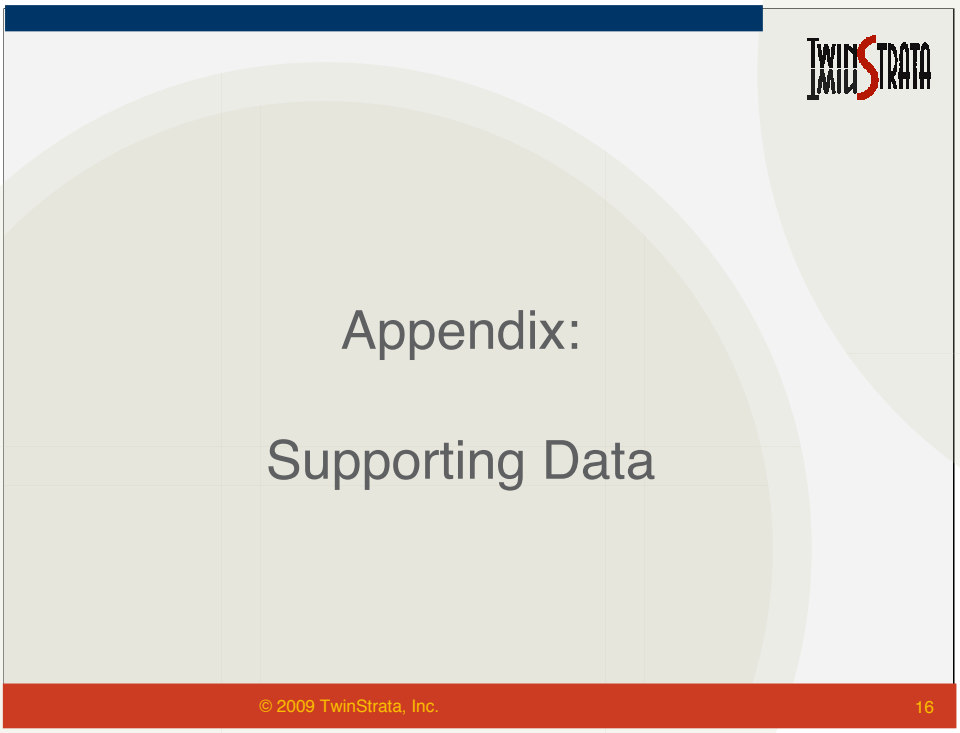


In conclusion, while there is a clear winner for the sample 20-employee organization we modeled here, there is still no "one size fits all" solution for every business

We see that Google Apps yields the best 3-yr TCO when there is a small/moderate cost of downtime to the business and/or smaller annual revenue risk. This may be ideal for a number of smaller businesses, such as the sample organization we modeled. A replicated network can potentially mitigate some of the risk further.

However, it is noteworthy that MS Apps yields a better 3-yr TCO when there is a more substantial cost of downtime or revenue risk to the business, provided that the local infrastructure is designed with appropriate policies and components to support uptime requirements. Such a configuration may be ideal for larger businesses with higher headcounts and/or greater revenue dependency on application uptime

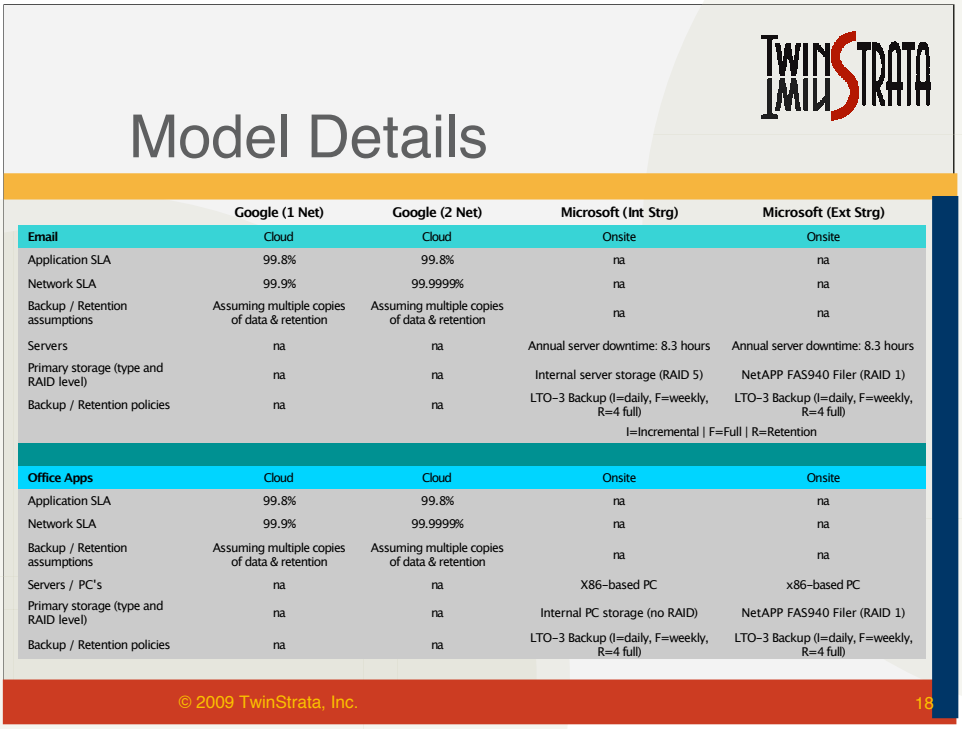
Visit www.twinstrata.com to download Clarity AP today to build your own comparison tailored to your business!



On behalf of all of us at TwinStrata, we thank you again for joining us today. We hope this webinar has been helpful, we invite you to download our planning tools and we look forward to joining you again in future installments. Thank you.

Clarity AP Business Impact Analysis (BIA)

Parameter	Value	Description
Organization Headcount	20	Assume a small business with 20 employees
Volume of new email per day	100 MB	Aggregate across all email users over the course of a day
Local copies of email for DR	none	Assume local copies of email are not centrally maintained for DR purposes
Email archiving policies	none	Assume the business is not obligated to archive email for compliance purposes (SOX or other regulatory requirements)
Email cost of downtime per hour	$500	Assume approximately a 50% hit on employee productivity when email server is down, at an average of $50/hr rate per employee. Approximately 20 employees x $25/hr. This excludes potential revenue loss which would make the cost higher
Email cost of data loss per GB	$5,000	Assume 1GB of email loss will result in a minimum 5 hr loss of productivity for all employees
Network effects	Model for hosted email	Regardless of whether email is hosted externally or internally an external network outage will result in potentia lost email from outside parties. However, if email is hosted externally, an external network outage will result in lost connectivity to the email server.
		Office Apps
Volume of new office documents per day	50 MB	Aggregate across all office applications users over the course of a day
Extra copies of documents	none	While it is good practice for users to keep extra copies of their documents for backup purposes, this model assumes users only maintain one copy of each document in the default work space
Office applications cost of downtime per hour	$250	Assume approximately a 25% hit on employee productivity when email server is down, at an average of $50/hr rate per employee. Approximately 20 employees x $12/hr. This excludes potential revenue loss which would make the cost higher
Office applications cost of data loss per GB	$30,000	Assume approximately 500 office documents per GB. For each document assume 3hrs to reconstruct or recover at a $50/hr rate
Network effects	Model for hosted applications	In the case of external hosted applications, we assume a loss of external network connectivity results in a outage to those applications. There is no assumption of offline capability



Model Details

	Google (1 Net)	Google (2 Net)	Microsoft (Int Strg)	Microsoft (Ext Strg)
Email	Cloud	Cloud	Onsite	Onsite
Application SLA	99.8%	99.8%	na	na
Network SLA	99.9%	99.9999%	na	na
Backup / Retention assumptions	Assuming multiple copies of data & retention	Assuming multiple copies of data & retention	na	na
Servers	na	na	Annual server downtime: 8.3 hours	Annual server downtime: 8.3 hours
Primary storage (type and RAID level)	na	na	Internal server storage (RAID 5)	NetAPP FAS940 Filer (RAID 1)
Backup / Retention policies	na	na	LTO-3 Backup (I=daily, F=weekly, R=4 full)	LTO-3 Backup (I=daily, F=weekly, R=4 full)
			I=Incremental | F=Full | R=Retention	
Office Apps	Cloud	Cloud	Onsite	Onsite
Application SLA	99.8%	99.8%	na	na
Network SLA	99.9%	99.9999%	na	na
Backup / Retention assumptions	Assuming multiple copies of data & retention	Assuming multiple copies of data & retention	na	na
Servers / PC's	na	na	X86-based PC	x86-based PC
Primary storage (type and RAID level)	na	na	Internal PC storage (no RAID)	NetAPP FAS940 Filer (RAID 1)
Backup / Retention policies	na	na	LTO-3 Backup (I=daily, F=weekly, R=4 full)	LTO-3 Backup (I=daily, F=weekly, R=4 full)

Note the 4 configuration that we compare have very different attributes as we are comparing hosted applications to local applications.

For the Google hosted applications, we use SLAs to determine application availability along with empirical data from prior actual performance. We are using values of 99.8% availability for the service itself and a 99.9% network reliability. With the dual-network model, network effects are taken out of the calculation with a 99.9999 SLA across independent network providers. We also model risk of data loss using an assumption of a multi-copy retention policy in the Google cloud that rivals/exceeds typical backup practices.

For the locally hosted MS applications run on PCs and servers with the data stored internally in the internal storage case and externally on a NetApp filer in the external storage case. In both cases backup to tape is used, with daily incrementals, weekly fulls and a retention policy of 4 full backups.

Model CAP-EX & OP-EX Comparison*

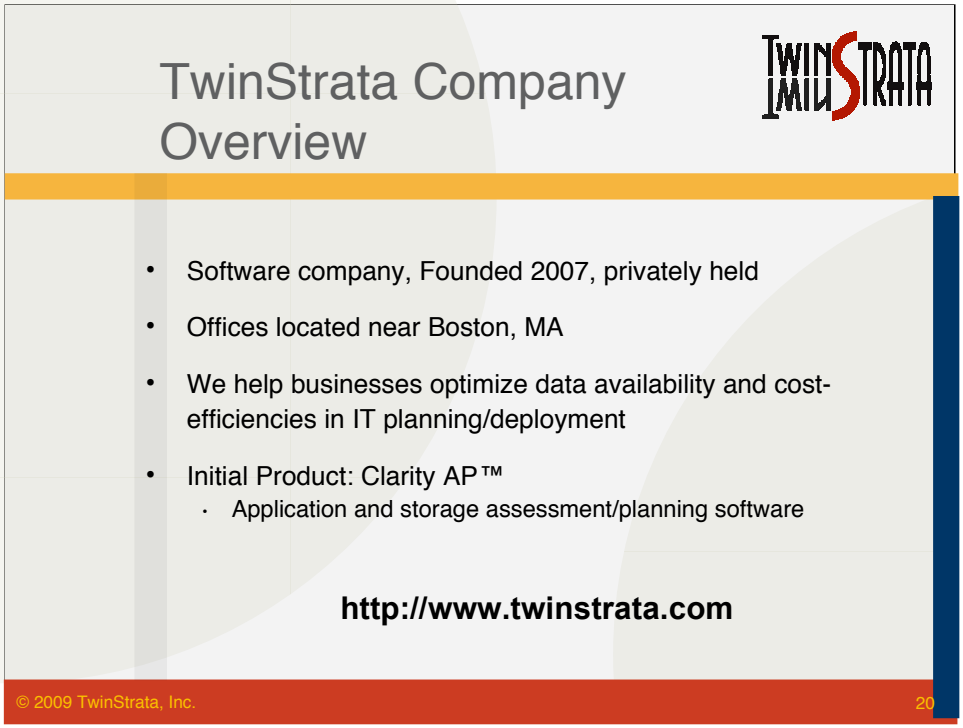
	Google (1 Net)	Google (2 Net)	Microsoft (Int Strg)	Microsoft (Ext Strg
Up-front cost				
Total server hardware cost ($5K per server)	$0.00	$0.00	$5,000.00	$5,000.00
Total Microsoft Exchange software licensing cost	$0.00	$0.00	$4,149.00	$4,149.00
Total Microsoft Office software licensing cost	$0.00	$0.00	$9,680.00	$9,680.00
Configuration labor cost for Gmail	$1,353.00	$1,353.00	$0.00	$0.00
Configuration labor cost for Office	$0.00	$0.00	$800.00	$800.00
Configuration labor cost for Exchange	$0.00	$0.00	$3,100.00	$3,100.00
Hard Disk Cost	$0.00	$0.00	$1,400.00	$3,000.00
Tape Drive Library Cost	$0.00	$0.00	$3,400.00	$3,400.00
NetApp Filer (Purchase Cost)	$0.00	$0.00	$0.00	$40,000.00
Total Up-front cost	**$1,353**	**$1,353**	**$27,529**	**$69,129**
Annual cost				
Google Apps Premier Edition licenses	$1,000.00	$1,000.00	$0.00	$0.00
Total infrastructure maintenance cost	$0.00	$0.00	$2,537.00	$2,537.00
Administration labor cost	$2,948.00	$2,948.00	$32,142.00	$32,142.00
NetApp Filer (OpEx)	$0.00	$0.00	$0.00	$6,000.00
Network Costs (annual)	$6,720.00	$13,440.00	$0.00	$0.00
Cost of Tapes	$0.00	$0.00	$1,080.00	$1,080.00
Cost of Incremental Backups	$0.00	$0.00	$3,128.00	$3,128.00
Cost of Full Backups	$0.00	$0.00	$1,564.00	$1,564.01
Cost of Disk Replacement	$0.00	$0.00	$22.44	$96.15
Cost of Array Replacement	$0.00	$0.00	$0.00	$1.09
Total annual cost	**$10,668**	**$17,388**	**$40,473.44**	**$46,548.25**
3 year TCO (Total cost of ownership)				
Total cost (over 3 years)	$33,357.00	$53,517.00	$148,949.32	$208,773.75
Annual cost per employee (over 3 years)	$222.38	$356.78	$993.00	$1,391.83
Annual cost per employee (over 3 years, excluding labor)	$154.40	$288.80	$350.16	$748.99

* Data derived from Google Apps Calculator, MS Open Business Licensing for MS Office and street pricing of server/storage components

We have also calculated an itemized list of costs for each of the four configurations that includes up-front costs, ongoing costs and a 3-yr TCO based on these costs.

All cost values were calculated from industry sources including:
-Google Apps calculator
-MS Open Business Licensing
-Street pricing of server/storage components

The TCO of the Google Apps solutions are significantly lower than the Microsoft solution for this sample company.



TwinStrata is a privately held software company located in Natick, MA with the goal to help businesses optimize data availability and cost efficiency in IT planning and deployment. Our initial product, Clarity AP, is application and storage assessment/planning software used for the analysis.