



Neustar® Webmetrics®

White Paper | Cloud Success in Seven Steps with External Monitoring

By:

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Overcoming and Managing Complexities in the Cloud

Executive Summary

Business models and the IT solutions that make them possible have become more complex in recent years. With the introduction of cloud computing, these complexities will become even greater. In order to manage this new environment, a higher degree of collaboration will be required across numerous parties – internal, cloud computing vendors, partners, suppliers, and customers.

In addition to increased complexity, there are many unique challenges associated with cloud computing. In a recent survey¹ of IT executives with cloud computing initiatives underway, the most commonly cited challenges included security, visibility, control and managing service level agreements (SLAs).

There are seven specific activities you can undertake to mitigate these challenges and improve the overall success of your cloud computing solutions. They are:

- 1) Define cloud computing objectives and benefits upfront;
- 2) Build the right partnerships to meet your objectives;
- 3) Identify and delineate areas of control across the ecosystem;
- 4) Agree on comprehensive SLAs;
- 5) Implement a monitoring and reporting solution to improve customer experience;
- 6) Develop a communications plan to encourage collaboration; and
- 7) Adapt the cloud computing solution as your objectives change.

Although listed as a unique step, a robust monitoring plan can provide data to support each of the other steps associated with a successful cloud computing solution. This is done by identifying problems before they become critical, providing tools for timely reporting and communication, and adapting as business requirements change. A third party performance monitoring service can be an important aspect of the solution, providing an unbiased end user perspective on performance that builds trust between all parties. A comprehensive monitoring solution allows IT organizations to then confidently use cloud computing to deliver demonstrable business value.

¹ “Thriving In The Ecosystem: How Web Application Interdependencies are Transforming the Business of IT”. Enterprise Management Associates. October, 2009. www.webmetrics.com/resources

Introduction

The main objective of a company's IT organization should be the enablement of business activities that create true and measurable value. This is achieved through orchestrating and streamlining business processes. As simple as this may sound, making this happen has become very complicated.

Managing a business and the technologies that keep it running is very complex. As a result, companies tend to have a narrow specialization built on their core competencies. This means it is necessary to have many partner organizations, both business and IT, in order to deliver end-to-end services or products that are valuable to customers. This is generally referred to as a "business ecosystem".

Business ecosystems are not new and have existed since mankind first began trading. Since the advent of the computer and telecommunications, companies have been using IT to manage these relationships and to integrate business processes along with information flows. The previous three IT waves used for integration were centralized computing, distributed computing (client/server), and networked computing. The fourth wave, which may include some or all of the previous three waves, is cloud computing.

Cloud Computing

It is not possible to read through an IT or business magazine without encountering at least one article that discusses cloud computing and how it is transforming the way in which companies approach IT. Cloud computing can simply be defined as the delivery of software-as-a-service (SaaS) and/or the use of external IT services via the internet. These solutions are designed and deployed to be flexible, scalable, interoperable, secure and sharable.

A cloud can either be a shared service provided by a third party, a dedicated service hosted by a third party, or an internal infrastructure that adheres to these concepts, all of which are connected via the internet. There are unique use cases and benefits associated with each of these models. This whitepaper discusses cloud computing in general terms. The benefits most commonly cited for adopting a cloud computing approach include:

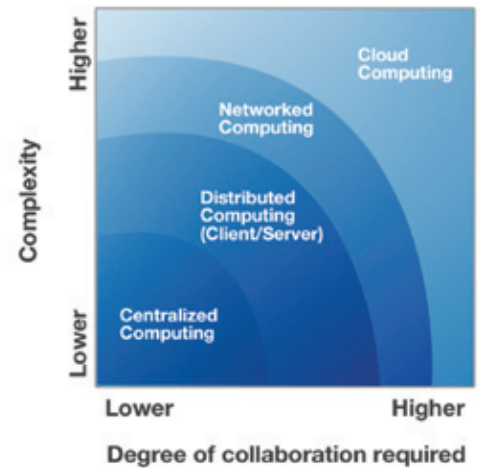
- Lower costs through sharing of infrastructure and excess capacity
- Faster time to market with services and functionality
- Better flexibility to scale for peak usage by utilizing external clouds
- Tighter integration with partners
- Easier management of IT services for technology professionals and business users
- Greater visibility into services and performance, allowing for better charging models

The paradox is that complexity has grown, in part, as a response to customers' desire for simplicity and excellence.

To best realize these benefits, an IT organization may need to utilize one or all of the cloud computing models mentioned above. The result of this is a greater degree of business process and technology complexity. Managing this complexity requires a tremendous level of collaboration between various internal departments and multiple third parties – cloud computing vendors, partners, suppliers and customers.

The paradox is that complexity has grown, in part, as a response to customers' desire for simplicity and excellence. As customers apply expectations developed from using best-in-breed solutions, regardless of the industry, use, or provider, their demands grow. In addition, switching costs in the online world are low, and a customer is just as likely to defect to a competitor because of quality of experience as they are because of quality of product. A customer wants to have a seamless, end-to-end experience. They also want it done now. To pull this all off, a higher level of collaboration between multiple parties is required.

The current challenge facing companies is how to satisfy increasing customer demand in a world in which they no longer own critical business and IT components and have limited visibility into cloud/ecosystem partners. Meeting these increased demands will require a similar level of effort and investment in collaboration tools for cloud computing as occurred with centralized, server and client computing.



Cloud Computing Challenges

In a study entitled “Thriving In The Ecosystem: How Web Application Interdependencies Are Transforming The Business of IT”², survey respondents were asked what obstacles they foresee when monitoring their cloud computing efforts. Each of these challenges needs to be adequately addressed if the promised cloud computing benefits are to be fully realized.

Security vulnerabilities – How do I ensure that everyone is adhering to the appropriate security and data privacy standards?

Lack of visibility – How do I look ‘under the hood’ of my cloud solution providers to see what they are really doing and ensure a seamless and appropriate user experience.

Overall lack of control – What should I be doing to address the shifting of internal resources to external services providers and demonstrate to management that a distributed cloud computing solution can work properly?

Lack of unified SLAs – How do I define SLAs across multiple parties and properly monitor them – especially when there are areas of overlap?

Lack of accountability – What are the mechanisms to enforce SLAs, contractual commitments, and best practices for all cloud providers and partners?

Business collaboration – How do I handle the soft issues and politics inherent when multiple organizations are trying to work together?

Unique API requirements – What are the integration challenges between all parties, and how do I design the APIs to work in this complex environment?



² “Thriving In The Ecosystem: How Web Application Interdependencies are Transforming the Business of IT”. Enterprise Management Associates. October, 2009. www.webmetrics.com/resources

To a large degree, none of these challenges are new to IT organizations. They have, however, become compounded by the decrease in control and centralization. Reliance on partners means clearly defining the division of responsibilities, defining minimally acceptable performance, and effectively monitoring to ensure that all parties are doing that which they promised. The last area, monitoring, can often separate success from failure. A lack of monitoring can result in delays, poor performance, excessive costs, and dissatisfied customers.

Seven Steps for Success

There are serious challenges to successfully setting up and managing an effective cloud solution, but they are not insurmountable. Through a thorough review of best practices based on successful deployments – both for cloud computing and the earlier computing paradigms – seven keys to success have been identified. Following these will help mitigate the challenges described above, create an excellent customer experience, and deliver true business value.

1. Define cloud computing objectives and benefits

As with all technology initiatives, cloud computing objectives should be directly linked to business objectives. Typical goals and benefits sought from cloud computing include reduced costs, increased flexibility and speed, and improved customer experiences. The objectives must be clearly understood by everyone involved, both on the business and technology side, if a cloud computing initiative is to succeed. Otherwise, a small disconnect early on will amplify itself throughout the process, resulting in failure.

Measurable, quantifiable objectives are best in order to reduce subjectivity. Some examples of potential goals that can be quantified include:

- Reduce annual hardware costs from \$X to \$Y over Z years
- Improve customer satisfaction rates X% over 3 years, as determined through customer surveys
- Increase online revenue by X% over last year
- Speed up development and implementation cycles by X%

2. Build the right partnerships to meet your objectives

Once your objectives have been defined, they can be used as part of your decision-making criteria for the partner selection process. As an example, if the primary objective is cost reduction, the partner selection criteria would look very different than decision criteria built around a world-class customer service objective.

Based on your technology requirements, the various components of each partner's solution should be identified at a high level.

These requirements can then be used to determine what will be kept in-house, and what components will be given to partners. Outsourced components can either be hosted in a shared environment or a dedicated environment. For example, many companies utilize web servers housed by third party vendors. This allows them to quickly scale when there is increased web traffic and to ensure that the latest security patches are in place. Depending on the requirements, these web servers may be shared between multiple companies or dedicated to a single one.

Finally, there are many cloud computing vendors and technologies out there. It is important to look at all potential partners in terms of technology and process integration, ability to collaborate, history and references, and long-term prospects. This last point is especially important. There are many new cloud computing entrants, and a lot of them may not be in business next year. It would be wasteful to invest a lot of time and effort into a partnership that may soon cease to exist.

3. Identify and delineate areas of control across the ecosystem

A company dependent on cloud computing solutions, along with their vendors and partners, each has individual areas for which they are responsible. These areas of control may have overlaps, and each one needs to be clearly defined – including areas of control and dependency within the organization. Once the ecosystem of partners has been built, it is time to further define and finalize areas of control across all partners. This may involve the partners speaking directly with each other. As part of defining the boundaries, the handoffs and escalation procedures should also be defined.

For example, your ecommerce site may rely on a third party SaaS solution for completion of the purchase transaction. While your customers only see your brand and hold you responsible for a failed transaction, the reality is that there are multiple parties and technologies involved. By defining areas of control for each step in the process, it is easier to identify who is responsible when there is a mistake or an opportunity for improvement. Overall, this will result in better customer experiences and work relationships between cloud computing partners.

4. Agree on comprehensive SLAs

Once the areas of control have been finalized, agreeing upon acceptable performance thresholds is critical. Sharing control requires a high level of visibility and trust. Each party, including the end customer, needs to be confident that the others are doing what is expected of them. Service Level Agreements (SLAs) allow you to define and agree upon acceptable levels of performance. Establishing SLAs is especially important at points of integration where clear ownership is hard to define.

Utilizing a third party monitoring solution to track SLA performance across the cloud infrastructure increases trust and visibility.

The most common SLA measurement is uptime. Other SLAs often measured include website response time, mean-time-to-repair, and web service failure rates. In addition to the standard SLA metrics, more tailored ones should also be defined based on the business objectives and business processes.

5. Implement a monitoring and reporting solution to improve customer experience

After SLAs have been identified, measuring performance against them is the next step. Utilizing a third party monitoring solution to track SLA performance across the cloud infrastructure increases trust and visibility. An objective, third party monitoring solution means each party can trust the numbers and be confident that individual areas of control are being properly managed. The data also allows for proper analysis and identification of the root of a problem (i.e. with which partner does the issue lie) and as a result, speedy resolution.

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The chart to the right details the challenges posed with cloud solutions, and identifies areas to monitor that address each of these challenges. For each item that is monitored, clear targets should be defined and evaluated, and corrective actions taken where necessary. These thresholds should be reached before customers notice the problem or before there is a significant impact on business or IT performance.

CHALLENGES	ITEMS TO MONITOR	End-user perspective/experience	Performance variations from global locations	Up time	Website response time	DNS response time	Web service & API performance	Web application & transaction performance	Network performance	Backend system performance	Security - attacks & protection systems	Unified SLAs	Benchmarks
Security vulnerabilities		✓					✓	✓		✓	✓		
Lack of visibility		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Overall lack of control		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lack of unified SLAs		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lack of accountability		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Business collaboration		✓		✓					✓	✓	✓	✓	✓
Unique API requirements				✓			✓			✓	✓	✓	✓

A monitoring solution that adequately addresses all of the challenges needs to be unbiased as well as sophisticated. Integrated monitoring across all the cloud solution participants creates even greater complexity. Therefore, it often makes sense for the company that provides the overall cloud computing service (as well as that company’s customers) to use a third party monitoring solution.

When comprehensive monitoring is in place, effective collaboration is possible and performance is optimized. Collaboration must take place between internal resources, cloud computing vendors, business partners, suppliers and customers. This requires timely reporting on all items that are monitored.

6. Develop a communications plan to increase collaboration

An effective cloud computing strategy must include a comprehensive communications plan that is timely and actionable across all members of the ecosystem. The plan needs to include parameters, thresholds, audiences, channels, and timings. Effective communication is bi-directional, so a company using cloud computing solutions should be willing to share relevant, internal information with others. Bi-directional communication also helps with visualizing and analyzing the end-to-end business processes.

With mission critical applications and business processes now operating in the cloud, fast and coordinated action is more important than ever.

A key objective of cloud computing monitoring should be the early identification and resolution of potential problems, achieved by effective communication and reporting across the ecosystem. At a minimum, an external performance monitoring solution allows problems to be quickly identified, analyzed, and resolved, before the customer is impacted.

Ideally, if the areas of control have been properly thought through, the monitoring data will identify where the problem lies, and provide secure, sophisticated tools for communication so the right partner is made aware of the issue and is able to resolve it quickly.

In addition, timely communication on SLA performance is very important since it is central to managing activities across all areas of control. A third party, external monitoring service for global SLA oversight should be considered so that all parties are confident the information they are receiving is correct and unbiased. This level of trust is central to a comprehensive cloud monitoring strategy that manages complexity and improves the customer experience.

With this level of communication, clear and decisive actions can be taken to reduce mean-time-to-repair and improve customer satisfaction.

Typical actions include: Analyzing and resolving performance issues; Upgrading and modifying the existing cloud solution; And developing long-term cloud computing strategies. With mission critical applications and business processes now operating in the cloud, fast and coordinated action is more important than ever.

With mission critical applications and business processes now operating in the cloud, fast and coordinated action is more important than ever.

7. Adapt the cloud computing solution as your objectives change

Lastly, any good cloud computing solution is by definition a dynamic one. Customers' demands, product offerings, technologies, and business requirements are always changing. A properly formulated cloud computing strategy needs to anticipate and adjust to these changes. This includes determining the proper balance between the three cloud computing models – internal, dedicated external, and shared external clouds – and the integration with internal systems and applications.

A part of the fix may require integrating multiple cloud computing services into a hybrid solution. This should become easier as global cloud computing standards are defined and embraced. The cloud computing solutions should be thought of in similar terms to Service Oriented Architectures (SOA). A given technology component, business process step, or data flow can be unplugged and replaced with another. Effective monitoring will indicate when an existing solution may be starting to “fail”, where to focus attention to fix the problems, and provide the necessary information to find new partners when needed.

It is important to note that while the seven steps are presented in a linear fashion, many of them will be undertaken in parallel. For example, SLAs (step 4) will begin to be defined as part of the negotiations when building the right partnerships (step 2). As with any complex undertaking, it is important to have the appropriate program management in place to see this effort through to successful completion.

Conclusions

Cloud computing is the latest wave in how IT is used to create business value. The use of clouds, both internal and external, will grow considerably in the near future. Because of the increased dependency on external parties, the business and IT complexity associated with these solutions is greater than with previous IT waves.

The seven steps outlined in this paper can help you better manage this increased complexity. Underpinning these steps, performance monitoring can provide the information needed to effectively manage a cloud solution. For every parameter monitored, clear thresholds and SLAs need to be defined. Additionally, monitoring reports and alerts need to be communicated and actionable. An external monitoring solution should also be considered as a means to build trust between parties and enforce SLAs

A comprehensive performance monitoring solution addresses problems before they become noticeable. It adapts as business requirements change. Overall, monitoring provides the data and analysis that allows an IT organization to deploy business enabling cloud solutions, which create true and measurable value.

About Neustar® Webmetrics®

Neustar (NYSE: NSR) provides market-leading and innovative solutions and directory services that enable trusted communication across networks, applications and enterprises around the world. Webmetrics is a Neustar service that delivers detailed availability and performance analysis, allowing for better customer-centric decision making. Webmetrics analysis provides visibility into business and technical interdependencies across Web ecosystems and clouds. Capabilities include:

- Ecosystem Management is a monitoring and collaboration platform that allows for effective management of third-party services relied on in the cloud and provides secure tools for sharing performance information with internal and external customers and partners.
- Application Transaction Monitoring simulates defined Web transactions, such as purchase order fulfillments, or customer logins, to provide detailed information on their performance from an end user perspective.
- Website Monitoring provides global awareness of Website availability with breakdowns on areas such as DNS time, time-to-first-byte, and transfer time.
- Web Services Monitoring monitors REST/SOAP Web service requests via XML request/response and content verification with additional support for transactional capabilities.
- Stream Media Monitoring allows for customizing the length of time to watch a stream and setting thresholds for connection timeout, buffer timeout, stream quality and other metrics.
- Network Services Monitoring monitors DNS, FTP, Ping, POP, and SMTP protocols to assess availability and connectivity.
- Load Testing services provide real-world validation that web applications are ready to go, with a fully managed solution that saves time and money.

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