

Review on Online SLA Tracking

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Abstract— In this paper we will review service level agreement. SLA (Service level agreement) are defined by an organization to fulfil its client requirements, the time within which the deliverables should be turned over to the clients. Tracking of SLA can be done manually by checking the status, priority of any particular task. Manual SLA tracking takes time as one has to go over each and every tasks that needs to be completed. For instance, you ordered a product from a website and you are not happy with the quality of the product and want to replace the same on urgent basis, You send mail to the customer support department, the query/complaint will be submitted in a queue and will be processed basis of its priority and urgency (The SLA for responding back to customers concern are listed in the policy). This online SLA tracking system will ensure that no queries/complaints are missed and are processed in an organized manner as per their priority and the date by when it should be handled. The portal will provide the status of the complaints for that particular day and the ones which have been pending since last week.

Keywords—SLA tracking, Priority, Quality, Service Provider, Request, Resource, Customer.

I. INTRODUCTION

The objective of this project is to monitor the Service Level Agreements within the Organizations which are known as Organization Level Agreements (which have buffer time before the SLA breach can actually happen). As mentioned above the SLA's have penalties attached if the service is not delivered on time hence OLA's are defined. This system will have the ability to differentiate the requests basis of their turnaround time. Lets say there is a process wherein the delivery time of the request or question is 5 business days, 3 business days, 1 business day and 1 hour time. The Tracking system will show the request which is near to SLA miss.

A Service Level Agreement (SLA) is a contract between a service provider and a customer that specifies, usually in measurable terms, what services the service provider will furnish and what penalties will assess if the service provider cannot meet the established goals. Service provider's differentiation will be driven by the reliability of the SLA Management and its monitoring during exploitation to contributing to the customers trust.

In order to guarantee customers the proper level of performance, service providers often offer services with SLAs, which provide customers with measurements of statistics. The paper is organised in the following way: First of all, the SLA and the deriving elements will be defined.

Then, a summary of the various views of service classifications will be presented. Finally, parameters to service assignment will be tackled. This paper concludes by an identification of major challenges that have to be faced to enforce SLA Management.

II. RELATED WORK

Many SLAs track to the Information Technology Infrastructure Library specifications when applied to IT services.

1) Backbone Internet providers

It is not uncommon for an Internet backbone service provider to explicitly state its own service level agreement on its Web site. The US Telecommunications Act of 1996 does not expressly mandate that companies have SLAs, but it does provide a framework for firms to do so for example ("Duty to negotiate") requires that ILECs negotiate in good faith regarding things like resale, access to rights-of-way, and so forth.

2) WSLA

A **web service level agreement (WSLA)** is a standard for service level agreement compliance monitoring of web services. It allows authors to specify the performance metrics associated with a web service application, desired performance targets, and actions that should be performed when performance is not met.

WSLA Language Specification, version 1.0 was published by IBM on January 28, 2001.

3) Cloud computing

The benefit of cloud computing is shared resources, which is supported by the nature of a shared infrastructure environment. Thus, service level agreements span across the cloud and are offered by service providers as a service based agreement rather than a customer based agreement. Measuring, monitoring and reporting on cloud performance are based upon an end user experience or the end users ability to consume resources. The downside of cloud computing, relative to SLAs, is the difficulty in determining root cause for service interruptions due to the complex nature of the environment.

As applications are moved from dedicated hardware into the cloud these applications need to achieve the same or even more demanding levels of service as classical installations. SLAs for cloud services focus on characteristics of the data center and more recently include characteristics of the network support end-to-end SLAs.

Any SLA management strategy considers two well-differentiated phases: the negotiation of the contract and the monitoring of its fulfilment in real-time. Thus, SLA Management encompasses the SLA contract definition: basic schema with the quality of service parameters; SLA negotiation, SLA monitoring and SLA enforcement—according to defined policies.

4) Outsourcing

Outsourcing involves transfer of responsibility from an organization to a supplier. The management of this new arrangement is through a contract that may include one or more service level agreement. The contract may involve financial penalties and the right to terminate if SLAs metrics are consistently missed. Setting, tracking, and managing SLAs are an important part of the outsourcing relationship management (ORM). It is typical that specific SLAs are negotiated up front as part of the outsourcing contract, and they are utilized as one of the primary tools of outsourcing governance.

In Software Development, specific SLAs can apply to application outsourcing contracts in line with standards in software quality, and recommendations provided by neutral organizations like CISQ, which has published numerous papers on the topic (such as Using Software Measurement in SLAs) that are available to the public.

Operational Level Agreement

An **operational-level agreement (OLA)** defines the interdependent relationships among the internal support groups of an organization working to support a service-level agreement (SLA). The agreement describes the responsibilities of each internal support group toward other support groups, including the process and timeframe for delivery of their services. The objective of the OLA is to present a clear, concise and measurable description of the service provider's internal support relationships .OLA is sometimes expanded to other phrases but they all have the same meaning:

- Organizational-level agreement
- Operating-level agreement
- Operations-level agreement

OLA(s) are not a substitute for an SLA. The purpose of the OLA is to help ensure that the underpinning activities that are performed by a number of support team components are clearly aligned to provide the intended SLA.

If the underpinning OLA(s) are not in place, it is often very difficult for organizations to go back and engineer agreements between the support teams to deliver the SLA. OLA(s) have to be seen as the foundation of good practice and common agreement, the sum of which may contribute to an SLA.

Now we are going to look more about online SLA.

A. Definition

A Service Level Agreement (SLA) is a contract between a network service provider and a customer that specifies, usually in measurable terms, what services the network service provider will furnish and what penalties will assess if the service provider cannot meet the established goals. Service provider's differentiation will be driven by the

reliability of the SLA Management and its monitoring during exploitation to contributing to the customers trust. In order to guarantee customers the proper level of performance, service providers often offer services with SLAs, which provide customers with measurements of statistics like network availability, throughput, and latency.

B. Issues of service level agreement

Service Level Agreement (SLA) specification and management becomes a key differentiator in the service provider's offerings. SLA management will allow service providers to offer different levels of service guarantees and to differentiate himself from its competitors. It will improve its ability to satisfy customer expectations, as the customer will exactly know what to expect in terms of quality of service. SLAs are also a key requirement for the deployment of multimedia over the Internet, i.e. for Next Generation Networks. The Internet today is however a best-effort network, without the need for such strict contractual guarantees. Therefore numerous initiatives are currently undertaken to specify SLAs and to identify the new challenges for the provider's service and network management.

C. SLA Market

An SLA by itself has no interesting value, if it is not managed efficiently .When considering the expectations of customers regarding the service providers, most of the market studies highlights the following requirement:

- Reliable measurement of the quality of services
- Provision of the expected quality of services
- Optimisation of the resource usage

SLA Management will be a key player in the adoption of the Next Generation Services (like Video on Demand, Unified messaging,...) offered by the Next Generation Networks and GPRS/UMTS. SLA Management will enforce the confidence customer can have on their use, and support the transition from traditional usage of the services, to more elaborated usage of these new services.

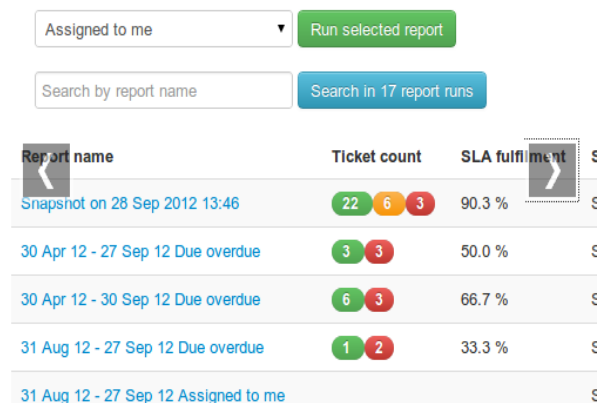


Fig.1 The number of ticket count on different dates.

In order to prioritize the things, this project will help the department in getting the request which is nearing its expiration or SLA miss. The system is designed keeping in mind the priorities of different requests. The emails were sent to a common mailbox which was manually checked by

a user accessing that mailbox. Below were the steps taken to get to the proposed solution shown in fig. 2:

1. The request or emails were categorized basis or urgency and type of request.4 priorities were defined for the requests which are Critical 1 hour, High 4 hour, Medium 1 day and Low 3 day .Due Date was added for every request that is received and a counter was set in all the requests which will count the days since the day it was created Different queues were setup as per the priority of the request so they fall under their respective priority. The Online SLA Tracking is designed in ASP and VB script which will pick up the data basis of priority and Due Date and show the requests in the below format on a web portal. The number of requests which are about to miss SLA will show up on the web portal in the following manner

Details								
Priority/Severity	All Open Requests	All Unassigned Requests	Requests Closed in last 24 hours	Open Requests that missed SLA in last 1 hr	Requests due in the next 30 mins	Requests due in next 30 mins to 2 hrs	Requests due in next 2 hrs to 18 hrs	Request due in next 18 hrs to 48 hrs
Critical (1hr)	0	0	20	0	0	0	0	0
High (4hrs)	5	2	114	0	0	0	0	0
Medium (1 day)	2	1	49	0	0	0	1	0
Low (3 days)	86	23	89	0	0	0	4	16

Fig.2 The number of requests which are about to miss SLA will show up on the web portal in the following manner

III. PROBLEM STATEMENT

1. It has been difficult for service providers to offer service level management and, therefore, sophisticated SLAs. This difficulty is based on the fact that service providers must deal with several different technologies and elements, often with parts of these segments "owned" by different service providers.
2. The second difficulty is the derivation of the SLA everywhere.
3. A manual exchange of the SLAs is possible, but this solution is expensive to create and the process is not automatic.
4. Share the management tools of various operators, but carriers and operators are not ready to lose the management and the monitoring of their networks.
5. Set up a common signalling with a generic policy manager. This solution is the one which satisfies best the current constraints of SLA management.

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REFERENCES

- [1] A. Anderson, "An Introduction to the Web Services Policy Language", in Fifth IEEE Int'l Workshop on Policies for Distributed Systems and Networks, 2004.
- [2] A. Andrieux, K. Czajkowski, A. Dan, K. Keahey, H.Ludwig, T. Nakata, J. Pruyne, J. Rofrano, S. Tuecke and M. Xu, "Web Services Agreement Specification (WS-Agreement)", Version 2006/09, World-Wide-Web Consortium (W3C), September 2006.
- [3] M. B. Chhetri, J. Lin, S. K. Goh, J. Yan, J. Y Zhang and R.Kowalczyk, A Coordinated Architecture for the Agent-based Service Level Agreement Negotiation of Web Service Composition, in Proc. of the Australian Software Engineering Conference, Sydney, Australia, April 18 - 21, 2006. pp. 90-99.
- [4] D. Greenwood, G. Vitaglione, L. Keller and M. Calist, Service Level Agreement Management with Adaptive Coordination, in Proc. of International Conference on Networking and Services (ICNS), July 16-19, 2006, Silicon Valley, USA. pp. 45.
- [5] L. J. Jin, V. Machiraju and A. Sahai, "Analysis on Service Level Agreement of Web Services", Research Report HPL-2002-180, Hewlett-Packard Laboratories, June 2002.
- [6] A. Keller and H. Ludwig, "The WSLA Framework: Specifying and Monitoring Service Level Agreements for Web Services", Journal of Network and Systems Management, v.11 n.1, March 2003. pp. 57-81.
- [7] H. Ludwig, A. Dan and R. Keamey, "Cremona: An Architecture and Library for Creation and Monitoring of WS-Agreements", in Proc of 2nd ICSOC, New York, USA, November 15-18, 2004. pp. 65-74.
- [8] H. Ludwig, A. Keller, A. Dan, R.P. King, and R. Franck, "Web Service Level Agreement (WSLA) Language Specification", Version 1.0, International Business Machines Corporation (IBM), 2003.
- [9] D. Ouelhadj, J. Garibaldi and J. MacLaren, "A multi-agent infrastructure and a service level agreement negotiation protocol for robust scheduling in grid computing". In Proc. of the European Grid Conference (EGC), February 14-16, 2005, Amsterdam, The Netherlands. pp. 651-660.
- [10] A. Sahai, A. Durante and V. Machiraju, "Towards Automated SLA Management for Web Services", Research Report HPL-2001-310, Hewlett-Packard (HP) Laboratories, July 26, 2002.
- [11] C. Sharp, J. Shewchuk, A. Vedamuthu, Umit Yalyinalp and D. Orchard, "Web Services Policy Framework (WS-Policy)", Version 1.0, March 2006.