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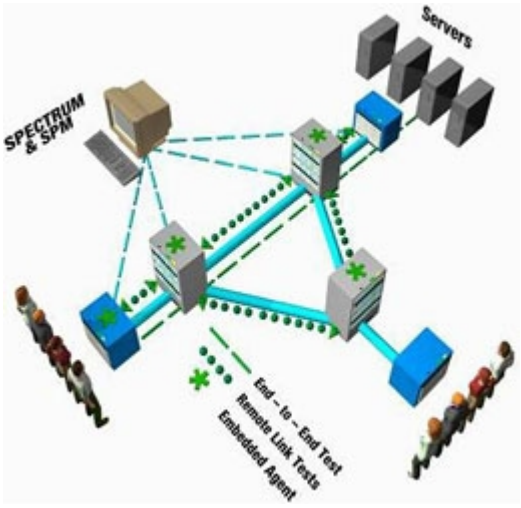
Service Performance Management: Pragmatic Approach

by Jim Lochran

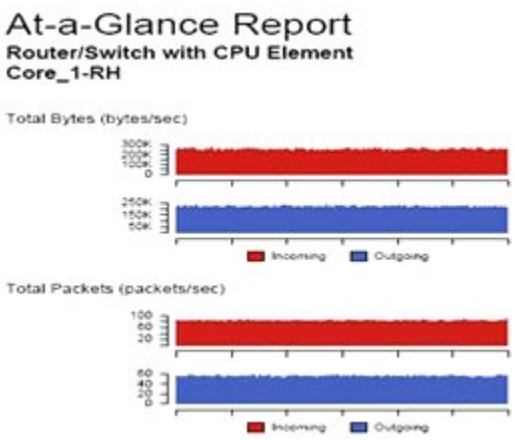
As the mix of service provider offerings become more IP centric, the need to overhaul existing service performance management techniques becomes increasingly acute. Historically, performance measurement of traditional fixed line services was well understood and very robust, this changed with the advent of converged networks and IP based services. In today's environment, service performance management is proving to be an area of considerable challenge both from a technology and cost perspective. These challenges are compounded by the fact that the infrastructure itself is still evolving as more and more services are being transformed into application components that collectively create a service. The paradigm shift in the architecture coupled with the ever growing demand for higher service quality is driving Communication Service Providers (CSP) to re-think their approach to Service Performance Management.



Service Performance Management is the process of measuring and monitoring the time it takes for services to respond to user requests and aiding in the isolation of the root cause of poor response time. A "service" is the unit of work a user has requested, whether directly or indirectly, via the infrastructure. This could be a complete transaction, such as submitting an order via a web site (amazon.com), downloading a file from an ftp server (iTunes), or logging into the mail server. A "Service" could also refer to an underlying infrastructure services, such as assignment of an IP address from the DHCP server or a request for name services resolution from the DNS server. In many cases, a service makes use of other services. For example, to access a web site the user enters a URL into their browser, which issues a request for name resolution (using the DNS server) and then attempts to connect to the web server before requesting the web page specified in the URL. From the end users' perspectives, the service is the web page, but in actuality they have performed three separate transactions using three unique

services (DNS, TCP, and HTTP).

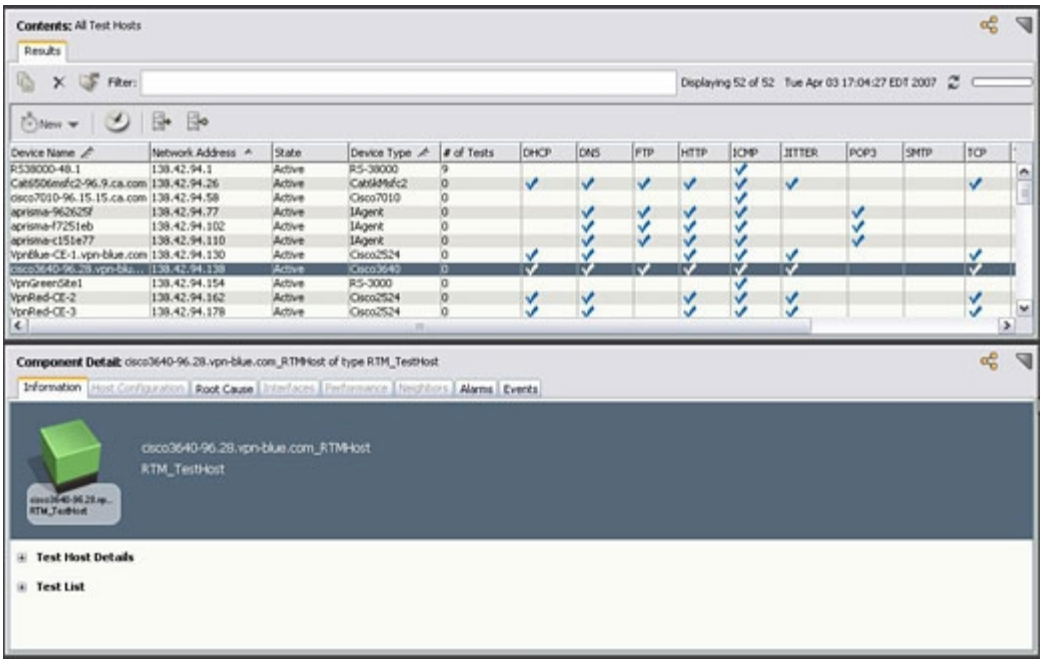
Perhaps one of the most challenging aspects of service performance management is the data - how to collect it, where to collect it, how to process it, how to analyze it and how to make use of it. There are two primary approaches to collecting service performance data, both involve the use of probes; where one is embedded within the routing infrastructure and the other leverages a purpose built appliance that is strategically placed within the network. Often times these two approaches will be used in concert so that a complete performance picture can be garnered. Combining the approaches, however, does not resolve the need to process and analyze the data. Since the true measure of service performance is determined by the cumulative health of a collection of monitoring points, the need exists for an aggregation layer which can assemble these monitoring points across the infrastructure into a holistic view of service performance. It is from this holistic view that the data can be analyzed for base lining, trending, impact and root cause analysis. Once the data has been collected, assimilated and analyzed the question of how to make use of the data can be addressed. The uses of the data can be generically considered in two ways; first the data can be used in real-time to proactively identify service performance problems before subscribers are impacted. Real time data collection is extremely valuable since its use can directly impact the bottom line via increased operational efficiencies and decreased SLA violations. Secondly, the data can be used for historical reporting for capacity planning and directed maintenance activities within the infrastructure. The value of the information collected from the infrastructure is significant as it can ensure business investments are made at the right time and operational efficiencies are optimized.



When considering the deployment of a service performance management solution, CSP's should leverage a pragmatic approach that emphasizes incremental improvements instead of a wholesale replacement of the current infrastructure. The pragmatic approach can be achieved by evaluating the current capabilities within the infrastructure in order to establish a foundation. The foundation begins with basic element performance. Metrics such as Interface utilization, errors / discards, CPU utilization, etc. should be collected from the network infrastructure via the performance management system. The collected information is critical to service performance issues as it is the basis for root cause analysis. Ultimately, it is this foundation that allows the CSP to build an overlay infrastructure of service performance management that works in conjunction with element performance in order to provide a holistic view of service performance.

Router vendors have been working on perfecting the art of service performance testing for years, with vendors like Cisco leading the way with their IPSLA capabilities. As a result, CSP's can now quickly and reasonably inexpensively build

an overlay infrastructure of service performance management probes leveraging the embedded capabilities within the routers. For example, vendor proprietary options exist like IPSLA that offer a wide array of service performance tests. CSP's also have the option of leveraging standards like RFC 2925 that offer a basic set of tests. It is important to note that the configuration and on going maintenance of this testing infrastructure must be taken into consideration particularly in instances where the CSP is operating a heterogeneous network environment. As stated earlier, it is in these environments that the need for an overall performance management application becomes a necessity in order to achieve desired results. The performance management application will provide a common aggregation point between the different router vendors within the infrastructure for probe creation, test administration, and test data collection. The application should also provide a mechanism to automate these tasks to provide a solution that can scale to meet the challenges of the CSP environment.



At this point, the CSP should take the opportunity to re-evaluate their service performance management coverage by looking for areas that need coverage or need additional depth of coverage. Once coverage gaps are identified; they can then be filled by leveraging purpose built appliances that are available on the market today. These appliances offer the ability to run a large number of service performance tests; however, they tend to be focused on voice (VoIP) or video (IPTV) testing. Accordingly, it is possible, depending on the mix of services that the CSP offers, that multiple appliance vendors may need to be deployed in order to achieve complete coverage. Another major consideration with regard to deploying appliances is the cost. Life cycle costs can be high depending on the appliances' maintenance cost and where it is deployed in the infrastructure. By taking a pragmatic approach and making efforts to minimize these costs, the CSP will ensure they are only purchasing appliances where they need them and getting full value from the data generated. The appliances should integrate into the overall service

performance management system to create a holistic view of service performance across the entire infrastructure.

In addition to the network layer testing covered above, the CSP is becoming increasingly dependent upon the performance of the application layer as services become decomposed into a collection of application components. Technologies such as VoIP and IPTV are well known examples of this process in action, however, the advent of IMS (IP Multimedia subsystems) and the fixed mobile convergence movement are true catalysts for the increased dependency on application layer performance. As the migration occurs, the CSP needs to consider adding an additional layer of service performance testing – which is very different from that used for network based services. In the decomposed services world, the reliance on technologies like SIP and Web Services creates a new level of complexity in monitoring service performance and identifying the root cause of service degradation. In order for CSP's to effectively monitor this new infrastructure, they must invest in application transaction monitoring systems that provide instrumentation at the application layer that monitors all transactions, creates a baseline for transaction performance and identifies the root cause in the case of a transaction failure or degradation. CSP's also need to resist the temptation to look at this infrastructure separate from the network infrastructure, this is just another component of the holistic service performance view and as such it should be tightly integrated into the overall service performance management solution.

In summary, service performance management is essential for CSP's to deliver services at the quality levels the marketplace is demanding. By taking a pragmatic approach to service performance management, a CSP has the opportunity to build upon their existing infrastructure and ensure that any additional investments are made in areas that provide a significant return. The process began with creating a solid performance management foundation to establish a baseline. From that foundation a CSP can overlay a service performance management infrastructure leveraging embedded capabilities in the network; this provides a rapid time to value and a deeper knowledge of the performance of the infrastructure and the services. It is from this position of knowledge that the CSP can look to fill in the gaps in the

performance picture with purpose built appliances that provide very granular and service specific performance data. Now that the CSP has the service performance data it must leverage analysis tools to proactively address performance problems before SLA's are impacted and leverage capacity planning tools for planned upgrades and directed maintenance.

CA is uniquely positioned to assist CSP's in these efforts. As a management vendor, CA is the only vendor that offers a multi-vendor, multi-technology, integrated and scalable solution to this complex problem. The combination of CA's eHealth, SPECTRUM and Wily Introscope offers an integrated solution for service performance management that spans the legacy and next generation infrastructures. These solutions are proven in the marketplace with installations in the majority of CSP's worldwide. CA's eHealth network performance management application provides a central repository for all network performance data, inclusive of network elements and service performance probes. CA's Wily Introscope provides complete insight into the application delivery infrastructure, monitoring all transactions and identifying degradations or failures. Finally CA's SPECTRUM provides the cross domain correlation and root cause analysis capabilities that CSP's require to ensure service quality is maintained and operational efficiencies are optimized. This integrated solution set is fully modular allowing CSP's to invest only in the components that address today's needs and overtime achieve incremental value by adding additional components as requirements change or expand.

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