An Ounce of Prevention Saves Pounds of Pain In the Data Center

RFG believes IT executives moving to transform operations to an elastic enterprise will benefit from rethinking their approach to managing data centers. With the need for on-demand services, it is no longer sufficient to manage and react to events; instead, IT executives need to prevent those events from occurring in the first place. The recent announcement by [Sun Microsystems, Inc.](#) of its Sun Preventive Services illustrates this facet, for users of Sun servers as well as other brands. The approaches, processes, and techniques utilized by Sun can be employed across multiple server brands. IT executives should use these as one benchmark to engender review and discussion of current data center management practices.

Business Imperatives:

- As IT executives strive to run IT under a services model, the data center has begun to focus on ensuring that capabilities are available "on demand". However, true on-demand computing cannot be achieved without ensuring the integrity of the data center. Sun's Preventive Services are designed to help IT executives increase availability and maximize efficiencies by monitoring data center health instead of performing crisis management. IT executives currently using Sun servers should examine how Sun's offering can assist in holistic data center management, and investigate how Sun methodologies can best be leveraged in the enterprise.

- Similar "preventive" services are also being offered from IT vendors such as

  [Hewlett-Packard Co.](#) (HP) and [IBM Corp](#). (IBM), and are designed to help improve operational efficiencies. These offerings to monitor data center health help IT executives to improve uptime in their environments. IT executives should review the value proposition of these offerings, as well as Sun's, to determine whether a subscription to these services is warranted.

- No service will meet all enterprise requirements, and preventive data center management requires a proactive approach to management from IT. This is a simple concept, but one that is sometimes taken for granted. IT executives and their data center staff should ensure that even the mundane processes and procedures are properly captured and documented. IT executives should also ensure that adequate numbers of properly trained staff are on site during all shifts, and that cabling is labeled properly. IT executives should review various tasks with their staff to ensure that data center management is as comprehensive as possible.

Traditionally, hardware IT vendors of all types have worked industriously to implement engineering techniques either to prevent chips and components from failing or to minimize the impact of failure when it occurs. Similarly, software designers have worked to minimize software code defects from affecting user environments. In parallel, IT vendors and users have worked together to implement various techniques to increase overall availability. Such techniques include component redundancy, dual pathing and switching, failover, and hot swapping of components.

Following in the same path, an entire industry with new terminology has evolved with one goal: measure everything in the IT arena: cost of outages, duration, impact analysis, mean time to failure, "n" nines of availability, and outages. The industry speaks in terms of managing incidents and overall availability in terms of Service Level Agreements (SLAs) and quality of service (QoS) agreements. All of these are concerned with measuring historical events, "things" which have already occurred.

While IT vendors have various processes to ensure the viability of proposed systems configuration or performance prediction tools, much of the IT industry is concerned with monitoring and measuring past events and ensuring that they do not re-occur. RFG believes insufficient attention has been paid to predicting probable failure points and mitigating the probability of their occurrence.

Enter Sun Microsystems. Sun recently announced that it would offer a subscription-based network services delivery model, Sun Preventive Services. Sun will provide customers with consulting, support, and training to provide a baseline diagnostic to expose risk factors, and then work with IT executives to manage those risk indicators. Sun aims to provide customers with comprehensive assessment, measurement, mitigation, and support for their data center environment.

The initial phase of the engagement is labeled "Get It Right." In order to measure and mitigate risk, Sun's Preventive Services will analyze Key Performance Indicators (KPIs), including the following:

- *Availability*

  – A measure of the ability of a component or IT service to perform its required function at a stated instant or over a stated period of time

- *Operational Risk Index (ORI)*

  – A weighted average of potential system risks that could impact operational performance

- *Process Index*

  – A measure of operational risks based on the use of industry best practices and procedures in the data center

- *Severity 1 Incidents*

  – The total number of Severity 1 incidents per month compared with the average number of Severity 1 incidents per month prior to Sun Preventive Services

- *Skills Index*

– A measurement of operational risk based on the aggregate skill levels of your IT staff

However, analysis is not limited to systems. Sun's service will also review people, processes, and products to expose risks in the IT environment. The service identifies gaps in the operational infrastructure through joint Sun-customer assessments of data center processes, environmentals, IT skills, and security.

Once an assessment has been performed and KPIs have been determined, Sun will work with the enterprise to set target values for improvement. A mitigation plan will be formed, covering people, processes, and products, and Sun will work in conjunction with the IT staff during plan implementation.

Sun tested its new services with 40 beta customers. The company said its services helped to improve system availability, decrease incident numbers, and reduce planned and unplanned outages. According to Sun, Sun-caused outages for a technology company were decreased from 27 percent of total customer outages to slightly over two percent of total outages and less than one percent of hardware outages. For an auto manufacturer, so-called "Severity One" incidents were decreased by 67 percent.

Once the agreed-upon KPIs have been sustained for 90 days, Sun offers customers the option of moving to the "Keep It Right" phase. Customers can receive a price discount, called a "Safe Driver Discount" by Sun, by contracting with Sun to provide ongoing risk management services. This service allows Sun to continuously assess the IT environment and provide services to measure and mitigate risk. The service includes reactive support once a problem has been identified.

IT executives should not overlook additional benefits of Sun's Preventive Services. The service provides users with one simplified contract, covering all Sun products in the enterprise, for one price. The service also provides IT executives with one point of contact, which can lead to improved response times once an incident does occur.

HP offers apparently similar services. However, these are not as comprehensive in scope and are largely storage-based. HP's approach is to monitor the networks, servers, and storage continuously for weaknesses and/or actual failures. HP's specific services include the following:

- Availability Assessment Service for SANs – Building on the High Availability Storage Assessment described below, the Availability Assessment evaluates and delivers detailed remedial recommendations for reducing or eliminating risks to availability in the SAN infrastructure. The Availability Assessment is available for HP StorageWorks MA6000, RA/MA8000, ESA/EMA12000, EMA16000, and Enterprise Virtual Array. It supports the Microsoft Corp. Windows NT/Windows 2000, HP OpenVMS, Tru64 UNIX, Sun Solaris, HP-UX, and IBM AIX platforms.

- High Availability Storage Assessment Service – This service provides an assessment of high-availability equipment usage in storage area network (SAN)/storage environments. The assessment includes IT staff interviews and onsite physical inspection by technical assessors.
- Instant Support Enterprise Edition (ISEE) Installation and Startup Service – The service enables HP remote support over the Internet. HP ISEE uses real-time hardware event monitoring and notification to identify and prevent potential critical problems during contract coverage hours. ISEE uses remote diagnostics and repair scripts to enable fast restoration of supported systems and devices remotely.

IBM has, literally for decades, been a proponent of system management –the umbrella or cover phrase for these types of efforts, processes, and tools. First with mainframes and more lately with servers, IBM provides a plethora of offerings to maximize availability.

More than Seventeen individual consulting services are offered by IBM's Global Service organization. Six of those services are germane to this preventive perspective on data center management.

- Business Resilience: increasing business resilience by reducing risks within IT and enhancing security
- IT Optimization Solution: leveraging IT assets and utilization, thereby improving ROI and optimizing the IT environment
- IT Infrastructure Services: optimizing existing IT investments while planning for the future with a view toward disaster recovery/business continuity considerations, improving agility, and implementing an on-demand environment
- Operational Support Services: monitoring the ongoing health and performance of the network environment
- Systems management consulting and design services: integrating people, process, technology and data to improve IT management
- Systems management services: providing assessment, strategy building, design services, implementation and deployment services across the wide panorama of systems management tools and techniques

Each of these services is priced separately. IT executives supporting IBM-branded mainframes and servers should seek proposals from IBM if these services are deemed attractive to examine.

The availability of Sun's Preventive Service should be perceived as a trigger causing IT executives to examine this offering in detail and compare it with competitive offerings from the other server vendors. This service should also provoke IT executives and their staff to review the current status and determine what steps could be taken independently, without a formal IT vendor program, to address existing exposures. While these steps might seem obvious or simple, Sun's experience with over 40 beta accounts suggests that these "simple or obvious" items are being overlooked in a significant number of IT establishments today.

Regardless of whether IT organizations deploy formal preventive programs offered by the server vendors, there are some activities and processes that a data center management team should do or review. These include, but are not limited to, the following:

- **Cables**

  . Label all cables or review the current connection status as necessary. Data center management should verify that data and communications, networking, and power cables are labeled at source and destination and on/under the floor. Dual-pathing, redundant, and UPS connections should be labeled as well.

- **Configuration Diagrams**

  . Ensure that data center configuration diagrams or schematics are up-to-date and available when needed to those who need them.

- **Disaster Recovery/Business Continuity Plans**

  . Verify that existing DR/BC plans are available, up-to-date, and understood by all of those affected.

- **Problem and change management procedures**

  . Review and verify that the problem and change management procedures remain effective.

- **Problem escalation procedures**

  . Ensure that problem escalation procedures, phone trees, management escalation processes, etc. are in place, understood, and followed.

- **Program run books and operations manuals**

  . Verify that program run books and operations manuals are up-to-date and contain proper procedures for error processing. Program run books and manuals should also provide escalation procedures if error processing is unsuccessful in resolving the problem.

- **Staff Training and Assignments**

  . Audit workforce assignments to ensure adequately trained data center coverage on third shift, over the weekend, and on holidays. Typically, the newest hired and least trained operators are assigned to these least desirable hours.

Taking steps such as those above will ensure that the data center is managed comprehensively and holistically. By focusing on prevention, IT executives position

themselves better to provide the service levels expected by their lines of business. Then, when events do occur, IT is primed to respond quickly to resolve the problem.

IT executives should work with the staff to formulate a plan of action to approach holistic data center management proactively. This plan should include reviewing services and products available to assist in supporting these efforts, as well as ensuring that processes and procedures outside of the service offerings are included in documentation as part of the formal management process.

RFG believes prevention is better than an after-the-fact cure in the data center environment. By gathering data consistently, IT executives are able to make informed, data-driven decisions to reduce variability and unscheduled events, allowing IT to meet SLA and QoS agreements. IT executives should closely review the services offerings from Sun and its competitors to determine where IT can best leverage the depth of technology and expertise of the vendors. IT should also review processes, operations, and skill sets on its own to ensure there are no gaps between service offerings and enterprise needs. Where such gaps exist, IT should work to document and outline proper procedures with staff, allowing for comprehensive management of the data center environment.

RFG analyst Ed Broderick wrote this Research Note. Interested readers should contact Client Services to arrange further discussion or an interview with Mr. Broderick.

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