HP OpenView Helps iDCs Manage Application and Database Hosting Services through a Complete Solution Architecture

The OpenView solution helps service providers rapidly implement a complete operations management architecture designed to provide reliable, efficient management of application and database hosting services through a single console.

Market Challenges

In an application hosting service, the service provider hosts the clients' applications in exchange for a subscription-based fee. The software suite is owned by the client. Application/database hosting involves setting up the hardware, networks, servers, and application software required to bring their clients online, and then providing operations management of the complete infrastructure.

Every service provider offering an application and/or database hosting service must be able to manage the availability and performance of that service. Without offering some level of availability and performance assurance, the service provider cannot attract, retain, or up-sell enhanced hosting services to their customers. In order to deliver an application hosting service at specified levels of availability and uptime, service providers require Operations Management Systems (OMS) that monitor, measure, troubleshoot, and report at both an infrastructure and service level. Increasingly customers are also looking to their hosting providers to offer additional performance management services and are prepared to pay a higher premium for response time as well as availability guarantees.

In addition to managing services that attract and retain customers, service providers also face an economic reality— they must profitably deliver this service. They must find a way to deliver a service efficiently, making these services available at Internet speed. Therefore, the Operations Management Systems must deploy quickly, through stepwise implementation, enabling efficient, cost effective management and usage tracking of the application/database hosting service.

OpenView Application/Database Hosting Solution

The OpenView application/database hosting software-based solution offers a stepwise, incremental approach to achieving rapid results. Depending on the service provider's business and operations model, certain components can be immediately implemented, offering a quick time to value. Key components in the solution include:

- *OpenView Operations (*OVO*):*
  A comprehensive systems and problem management solution providing out of the box systems monitoring capabilities using a distributed agent architecture.

  OVO makes the entire infrastructure visible in both physical and logical views and consolidates, correlates, and escalates faults to the operations staff. Intelligent agents monitor disk space, CPU usage, syslog, swap space, paging, shared memory and other important system characteristics. Extensive event suppression, duplicate message handling, message counters, distributed event correlation, distinct operator responsibilities and customizable operator workspaces enable elimination of “noise” and reduction of message rates to enhance the efficiency of operations staff. Events are captured in a highly scalable Oracle database made available through “Oracle for OpenView”. With its powerful and integrated automation engine, it can fix problems on remote servers as they arise or even automate the resolution without operator intervention.

To eliminate single points of failure, OVO includes hot standby intra-site and inter-site failover capabilities. Additional policies can easily be created for monitoring customer-specific metrics or consolidating events from third-party event management systems. These policies can be mass-deployed on newly provisioned systems using the flexible configuration APIs within OVO.

- OpenView Internet Services (OVIS): Complements server level management by monitoring Internet applications and services from an external perspective.

  OVIS includes a GUI for establishing availability and response time objectives for customized web applications and key Internet services, probes that actively monitor these applications and Internet services, and a dashboard for near-time customer and service-centric reporting. Customized applications are monitored by creating a customized probe using the Web Transaction Recorder, which captures all URLs, forms and authentication inputs, and handles dynamic content such as auto-generated URLs and session ID's.

  OVIS integrates tightly with the OpenView Operations console. This integration includes pre-defined management policies to extend OpenView Operations to manage Apache, iPlanet/Netscape, IIS web servers and firewalls such as CheckPoint Firewall/1. Also, as response time and availability violates service level objectives, the OpenView Operations console will receive that event and forward it to the appropriate operations staff. With simple install shields and configuration wizards offering preset base-lined service level thresholds, OVIS is monitoring hosted servers within minutes.

- OpenView Smart Plug-Ins (SPIs): Out-of-the-box management policies, reports, and other tools that snap into HP OpenView Operations. Currently, OpenView offers Smart Plug-ins for major databases (e.g. Oracle), ERP, e-commerce applications and web application servers. Smart Plug-ins enable iDCs to deploy an application hosting management solution even quicker, as they save the iDC the work of configuring the operations management system to manage a specific application. In addition, gateways are offered for third-party management solutions (e.g. Oracle Enterprise Manager, Remedy ARS, BMC Patrol 2000).

- OpenView Service Navigator (OVSN): Models and displays fault and performance events as service and customer impact information, including root cause analysis, which isolates the source of the service disruption.

- *OpenView Network Node Manager (NNM):* Discovers, graphically maps, and monitors network devices for fault and SNMP-based performance information. Integration with hundreds of partners provides the ability to configure network elements with NEP tools, while managing the entire network in parallel. Designed for ease of use and speed of deployment and with advances in layer-2 switch management, NNM provides a comprehensive approach to managing the network element layer of the iDC.

- *OpenView Service Information Portal (SIP*): Presents managed services status directly to customers of the service provider. Service Information Portal integrates with NNM to present network availability, performance, and topology information directly to the iDC's customers. SIP offers out-of-the-box integration with OpenView Internet Services and OpenView Service Navigator, enabling service providers to communicate near-time service level information to their customers. As a result, the Service Provider can differentiate their managed service and retain customers through superior customer care.

- Internet Usage Manager (IUM): A mediation platform for collecting usage information from key Internet devices, correlating it with customer information, and pushing consolidated usage information to billing systems, based on the needs of the Service Provider.

- OpenView Performance (OVP): Measures hundreds of system and application performance metrics on a variety of platforms. Using OVP, agents collect performance metrics on an ongoing basis, while forwarding alarms to OpenView Operations as performance crosses administrator-defined thresholds. OpenView Performance Analyzer offers real time performance analysis, which helps isolate performance issues before they become problems that customers notice.

- OpenView Reporter (OVR): OpenView Reporter generates business-level, web-based reports based on information gathered by OpenView Performance and OpenView Operations.

Solution Benefits

This solution brings several benefits to the iDC:

- Comprehensive management across networks, systems, and applications, forwarding fault and performance event information into a single console.

- Offers capabilities to manage a service by measuring from an external viewpoint, as well as managing the specific elements of the infrastructure and to tie the two approaches together using hierarchical service views.

- Powerful agents coupled with application-specific plug-ins enable easy detection of application and system performance bottlenecks and automated responses to critical problems.

- The component-based and open architecture allows iDCs to implement the products that meet their most pressing needs first, and easily extend and customize the Operations Management System to meet a robust set of needs over time.

- The solution not only empowers the iDC operations and management to keep their service performing well, but this information can be directly communicated to the customers of the iDC as well. This capability sets OpenView apart as the OMS leader for application/database hosting.

Sun Solutions

The OpenView Application/Database Hosting Service Management solution operates on a variety of Sun systems. The following table provides the hardware used for the reference architecture.

Typical Sun Solution	Usage
Per regional application hosting site:	
2 Sun Enterprise 4500 servers	Event consolidation, operator console, network discovery
2 Sun Enterprise 420R servers	Network event interception and forwarding, usage data retrieval and aggregation, service probes
Sun workstations	Consoles for central operations staff
On central site:	
4 Sun Enterprise 4500 servers	Event consolidation, event history, central operator console, help desk, and service information portal
1 Sun Enterprise 420R server	Configuration & change management system
Sun workstations	Consoles for central operations staff

Reference Architecture

The reference architecture presented in Figure 1 has been implemented to manage a multi-site application/database hosting service provider infrastructure with advanced requirements on scalability, high-availability, configuration & change process, and customer service. The service provider offers to manage connectivity, networking bandwidth, server availability and performance, and application health and performance. Development and configuration of the application is the responsibility of the customer.

The customers' application and database servers are located within a protected network and the web server for remote access is located in an externally accessible part for the service provider's network. Besides the standard networking gear (routers, switches, firewalls), load balancers are found in this environment, which provides increased performance and availability for the web application access. The management infrastructure is firewalled from the customer environment. There is one central management site, which hosts the help-desk staff and the customer information portal.

In each regional site, the service provider uses vendor-specific tools to manage and configure the internals of the network devices (e.g. CiscoWorks). OpenView Operations (OVO) has been chosen for the consolidation point for all operational tasks, specifically for the monitoring of network, servers and applications. Within the OVO console, the OpenView Performance (OVP) GUI is used to graphically analyze system performance bottlenecks and trends. The Network Node Manager (NNM) components of the OVO server are used to discover the network topology and to continuously check the status of all discovered network devices. The NNM collection station in the externally accessible network is used to intercept SNMP traps directly from the network device and to accept events from the vendor-specific tools. All NNM events are forwarded into the OpenView agent software, which sends it to the OVO server through a firewall-secured communication channel.

Operators can use the OVO console to detect, analyze, and resolve problem events and to launch the vendor-specific tools. OVO event & configuration data is stored in an Oracle database. OpenView agents also intercept events from the backup system and from Sun Management Center server, which is used for its hardware monitoring capabilities.

There are OpenView agents installed on all managed systems (e.g. application servers). The agent collects and stores extensive system and application performance and resource data using predefined or external data sources. The agent performs threshold analysis, monitors critical logfiles and forwards internally and externally generated events to the OVO console.

Event correlation is also performed to reduce additional communication overhead between the agent and the console. Reliable communication offers buffered messaging and guaranteed message delivery and can be secured using multiple encryption alternatives. The agent can fix problems on remote servers as they arise or even automate the resolution without operator intervention.

Application-specific templates, delivered through OpenView “Smart Plug-Ins”, are used to configure the OpenView agent to monitor application-specific components such as processes, logfiles, etc.

OpenView Internet Service (OVIS) is used in the regional site to actively probe availability and response time of network, system, and application related services, using probes generated by the Web Transaction Recorder for complex, multi-URL applications, as well as standard probes for ICMP, HTTP, WAP etc. Systems running the probes are located in the externally accessible part of the network infrastructure to best simulate customer access. The probe systems feed the response time

data back to the OVIS measurement server, which generates web-based real-time status reports on SLA fulfillment, performance and availability; but which also generates reports on performance and availability over time. OVIS can also be used for root cause and trend analysis.

The OVIS measurement server also generates events about SLA, performance, or availability problems, and forwards them to the OVO management server through local OpenView agent software. Events from the regional OVO server can be forwarded to the central site's OVO server either automatically or based on time of day, problem category or operator request (escalation). The central event store also allows for consolidated event correlation and analysis. The central site's OVO server is integrated with the OpenView Service Desk help desk system Through this integration, events can be linked to and synchronized with customer calls.

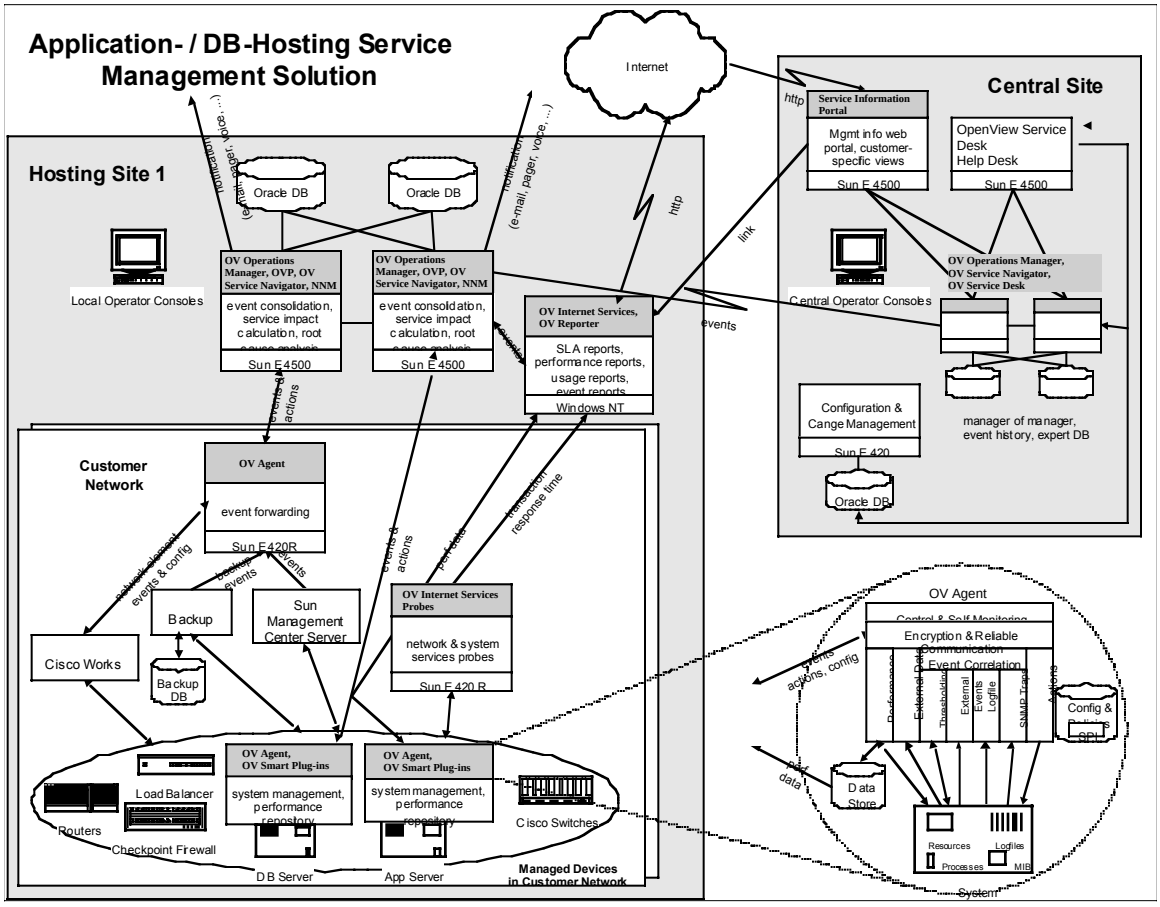
In the central site, the OpenView Service Information Portal (SIP) provides a web portal for the service provider's customers to review the network status of their equipment, network service performance, and SLA fulfillment. The performance and SLA reports are provided by the regional OVIS servers, and they are seamlessly integrated in the overall SIP presentation design.

The central site also hosts a configuration & change management application, which is used to maintain control over planned & unplanned changes in the overall environment. The configuration & change management system is integrated with the help desk system and the OVO management server.

Sample Installation

The architecture is currently used to manage up to 2000 servers per site and has been designed to handle a total of 105,000 systems in three sites within two years by duplicating the architecture.

Figure 1: Reference Architecture



OpenView in the iDC Architecture

The OpenView solution focuses on Customer Care, Service Management, Network Management and Service Platform management. The scope of the solution is assuring the availability and performance of web services and reporting this back to customers.

About HP OpenView

HP OpenView is the world's leading provider of Internet and e-services management solutions. OpenView's unmatched suite of integrated solutions and services drives Internet business success by enabling Internet businesses of all kinds to provide the fastest, most reliable customer experiences. OpenView solutions are at work in more than 135,000 multivendor distributed computing environments worldwide.

Together with offerings from more than 200 partners, OpenView offers a comprehensive portfolio of services and management solutions for integrated service management on all major platforms. OpenView's SunTone℠ certification demonstrates our commitment to excellence in supporting the service provider's quality of service for operations and infrastructure.

Information about OpenView and its solutions can be found on the Web at **http://www.openview.com.**

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With more than $17.6 billion in annual revenues, Sun Microsystems is a leading provider of industrial-strength hardware, software, and services that power the Internet. The reliable, scalable, high performance Sun Enterprise and Netra servers running the Solaris 8 Operating Environment are the platform of choice for major Internet data center and application service providers around the world.

Through the SunTone certification and branding program, iDCs can distinguish themselves as providers of high-quality outsourced services and applications. The SunTone brand is a symbol of excellence, marking service providers' commitment to using best practices for operations and infrastructure to deliver high quality of service.

For more information on Sun products, solutions, and programs for iDCs and service providers, visit **www.sun.com.**