

HP OpenView
VantagePoint

Scaling the Summit of E-Enterprise Management

BACKGROUNDER

January, 2000



HP OPENVIEW

Works | Right | Now

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The VantagePoint Vision

Business Drivers

IT is the Business

“Reality hit when online trading services grew in two weeks to what was expected to happen in a year.”

*Gideon Sasson,
Charles Schwab*

Forced from relative obscurity behind the scenes, today’s Information Technology (IT) organization is at the front-line of the business – and for the new “dot.coms”, IT *is* the business. Now on center stage, IT is expected to move away from its traditional role of providing infrastructure maintenance and transform itself into a direct and nimble implementer of business strategy. There is an urgent need for IT to prove its value to the enterprise and quickly change its perception -- from reactive cost center, to a profitable service organization offering strategic differentiation for the business while simultaneously being held accountable for service levels provided to end-users.

Unpredictable Growth

“In the face of outsourcing, IT organizations are being forced to align with their business partners.”

*Gartner,
November, 1999*

Rapid change and complexity abound, compounded by unprecedented growth in the use of IT services. Most analysts estimate a near ten-fold increase in electronic transactions over the next three years. New applications, new systems and new networks are being added at a frantic pace, while technological approaches to networking, database, application, hardware and software platforms continue to diverge. Selective outsourcing, re-organizations, and merger activity magnify the challenges by continually re-shuffling technology responsibilities and causing IT process change.

IT Skill Gaps

“Demand for skilled IT resources is increasing at 10-20% per year, and specialized areas even faster, meanwhile the readily available supply is growing at closer to 1%.”

*Yankee Group,
October, 1999*

Finally, IT organizations are struggling to recruit and retain skilled technical resources. IT staff with experience are often hard to keep. Recent graduates with freshly minted skills frequently have little practical experience, while new hires and consultants bring added risk and expense to projects. Lacking the luxury of lengthy project schedules, companies are unable to cultivate in-house teams for new Internet technologies and applications. To fill the gap, employers are outsourcing specialized IT functions, and making use of service providers for everything from network communications to applications hosting to desktop management.

The Imperative

At the heart of this fragile “make or break” environment lies the IT infrastructure and the people who manage it. The new economy requires a new approach to IT management -- one that is business-centric, adaptable, and skill-friendly.

Scaling the Summit to VantagePoint

At The Bottom, Looking Up

Managing an enterprise IT environment has never been easy. At times it has felt like a daunting, even impossible, mission. Despite continual advances in technology solutions, IT staffs spend precious time and energy on tactical issues: reacting to the flurry of helpdesk calls, grappling for root causes, and mentally associating component dependencies to determine the culprit behind an application service slowdown.

Historically, major enterprise management vendors have taken a bottom-up approach in which system management tools detect a failed or degrading element (e.g. router, disk, CPU), then drill down on that element to identify the root cause (e.g. run-away process). This approach is still broadly accepted in many IT organizations, and aligns well with the “silos” of responsibility that continue to prevail.

Yet technology “silos” make service guarantees difficult. Even in centralized IT organizations, multiple technology groups control only subsets of the whole service. Most firms can’t measure the experience delivered to end-users, let alone provide service guarantees.

Base Camp

More recently, point solutions have emerged which take a top-down, customer-oriented view of management. These application and service management tools measure availability and performance from the end-user’s perspective, generating IT service views to assist in immediately determining the impact of lower level infrastructure problems on higher-level business processes. While effective in operation, this approach requires an intimate understanding of the dependencies between managed objects, guesswork, and the laborious task of creating and maintaining views to be consistent with the managed environment. In an attempt to diagnose the root cause, IT staff are forced to manipulate management data between multiple tools with incompatible data structures, user interfaces and workflows. Finally, these tools - distinct and separate from back-end IT operations - do not help isolate IT elements that can impact future success and customer satisfaction.

The View From the Summit

To take its place at the head of the line as a strategic corporate asset, IT must align with business strategy, and business functions must become inseparable from computing and networking technologies.

HP OpenView VantagePoint enables this paradigm shift by providing a revolutionary business transaction management solution that merges the best of new technology and state-of-the-art process knowledge, increasing the odds of reaching the top. Whether an organization is a traditional brick and mortar business making the “e” transition, a dot.com, or a healthy mix of “brick and click”, HP OpenView VantagePoint’s blend of enterprise management will impact both top *and* bottom lines, and simply give business a whole new point of view.

Intelligence You Can See: Planting the Flag with VantagePoint

Solution Development Retrospective

HP OpenView's Service Management initiative, launched three years ago, was well received by customers and industry analysts, quickly differentiating OpenView from its major competitors. With dramatic software technology changes and the phenomenal rise in "electronic enterprises" due the Internet, the move to offer management tools that would enable a service-oriented IT management approach was timely, and would be vitally important in the long-term.

At the same time, analysts began reporting dismal failure rates for large enterprise management framework implementations. HP OpenView's integrated family of solutions gave customers far more flexibility than the "one size fits all" management frameworks; however, customers continued to express a need for greater depth of integration and faster solution implementation capabilities to keep up with their increasing business demands for new IT services.

Another trend was the rapid increase in Windows NT adoption, with the requisite need for enterprise-capable Windows NT-based management solutions.

The historical view of IT departmental organization is that of management "silos" divided along technology lines; e.g., a network management team, a systems management group, a storage management administrator, etc. Enterprise management solutions have typically evolved along similar infrastructure/hardware component lines. For the most part, tools were developed independently to solve a specific management issue, which matched the individual needs and relatively small overlap of customers' technology silos.

Today's businesses cannot be successfully enabled from hardware-oriented IT management silos since applications - and the services built on them - cross boundaries. IT organizations must be able to manage a service from the backend server to the end user, which in today's e- enterprise, more often includes external users. Managing a business service from end-to-end also means collectively managing all the infrastructure elements that affect the service.

To thrive in this new service-oriented IT paradigm, customers need solutions that integrate management functions and offer a consistent data structure and interface to ensure that critical business transaction information is accessible to all business groups who need it.

Primary Solution Goals

Delivering a solution to enable a true business transaction orientation to IT service management required the HP OpenView team to design a mechanism for organizations to visualize the entire service environment. Component-by-component management was insufficient because it provided no means to reflect the relationships between components that comprise a given service. Since services could be based on any type of application -- from a commercial email package to a full-blown ERP (Enterprise Resource Planning) solution that generates multiple services -- the need was for a way to first characterize an individual service, and then manage all elements it depends upon.

The first step was development of an innovative VantagePoint architecture based on three key concepts – *BUSINESS-DRIVEN INTELLIGENCE, ACTIVE INTELLIGENCE, AND INSTANT INTELLIGENCE.*

BUSINESS-DRIVEN INTELLIGENCE

HP OpenView VantagePoint's business-driven intelligence helps organizations align business goals with IT processes.

Business-driven intelligence addresses the following needs:

- Provides executive or business-centric views of business-critical services for IT and LOB managers.
- Quickly shows the business impact of IT by easily relating business processes to services and their underlying network, systems and applications elements.
- Measures IT performance in terms of business service objectives and bottom-line results.

BUSINESS-DRIVEN INTELLIGENCE IMPLEMENTATION

Business-driven intelligence is rooted in HP OpenView's Service Navigator technology, first developed to provide a "visualization mechanism" for IT services managed by HP OpenView IT/Operations.

With VantagePoint, this capability has been transformed into a uniquely visual, intuitive and flexible business transaction management paradigm.

Business-centric Service Views:

With service views, IT and LOB management can for the first time truly visualize how IT resources work together to deliver business services as well as clarify the bigger picture or focus on a particular managed object and its parent/child relationships. Network elements, computer systems, databases and the application itself are all displayed to show which components comprise a given service, so in the case of a component failure, it is immediately clear which services are at risk.

The screenshot displays the HP OpenView VantagePoint interface. The top window, titled 'NewName Demo', shows a service view diagram. The diagram illustrates a central 'Web Store' service (highlighted in blue) connected to various business processes and IT components. Business processes include 'Marketing', 'Organization', 'Finance', 'Customer Experience', 'Item Search', 'Display Home Page', 'Check Out', and 'Add to Shopping Cart'. IT components include 'Managed Application Services', 'Database', 'SAP', 'OV Enterprise', 'Web Site', 'Web Page Response Time', and 'ProductDatabase'. The diagram uses green lines to show dependencies and relationships between these elements.

The bottom window, titled '1: Console Root\HP OpenView NewName : omnichp\nodes', shows a console log with the following data:

Severity	S	U	I	A	O	N	Date	Time	Service	Node	Application	Object	Message
Major	-	X	-	-	-	-	2000-01-12	11:52:25	Database	DBServer	database	proddb	Cache hit ratio is low

At the bottom of the console window, there are status indicators for various metrics: 0 errors, 1 warning, 0 critical, 0 info, 0 debug, 0 trace, and 0 audit.

SERVICE MAPS -- VISUALIZATION WITH THE HYPERBOLIC TREE.

Management models are uniquely visualized from the VantagePoint Console via a dynamic and graphical representation of service elements called a Service Map. This specialized interface allows association of the network's physical infrastructure with logical business services. The Service Map displays an entire business service view in a tree hierarchy to illustrate the relationships and dependencies between map elements. To "drill down" on a particular node or element, you simply click on that element and drag it to the center of the screen. As a node is being dragged, the orientation of the map changes so that the selected node is the highest point of orientation of the tree, with the lower level dependencies displayed appropriately. This enables instantaneous drill down capabilities to identify the root cause of a particular problem. The map provides color coding to show warning or problem states, and virtually unlimited scalability, ensuring that VantagePoint will be adequate to map even the largest OpenView customer environment.

VantagePoint Reporter:

VantagePoint Reporter also supports the service-level vision by providing standard and customizable reports that show IT service quality levels (application response times and service availability) from aggregated event and performance data to provide business users with timely, accurate reports on service delivery performance.

ACTIVE INTELLIGENCE

HP OpenView VantagePoint's active intelligence helps today's service-oriented IT departments provide highly available business services, enabling IT to meet the expectations and rapidly changing needs of their business customers by delivering automatic, guided quality of service.

With considerable market-hype around root-cause analysis, distinguishing between real problems and the "symptoms" of problems has proven elusive and beyond the architectural capability of traditional management tools. VantagePoint takes root-cause analysis to a new level - reducing the guesswork associated with diagnosing problems and minimizing the human and technical resource load.

Active Intelligence addresses the following needs:

- Provides increased availability and enhanced performance of key business services.
- Helps IT to identify, analyze and resolve problems quickly, automatically, and with direct reference to their root cause and to impacted business services and applications.
- Provides "out of box" find, fix and report capabilities for strategic business services based on key technologies (e.g., Microsoft SQL Server)
- Variable and dynamic problem detection and resolution capabilities.
- Automation reduces the people time and skills required for tactical operations management, allowing IT departments to focus on critical business issues with more efficiency and at greater cost-effectiveness to the organization.

ACTIVE INTELLIGENCE IMPLEMENTATION

VantagePoint's active intelligence approach is based on the following leading-edge concepts:

Guided Benchmarks:

When first deployed, VantagePoint collects defined service level statistics (e.g. response times on key transactions, service up time, and recovery time). Summary information, presented on a days-of-the-week basis, provide a time-sensitive foundation for establishing more meaningful service level agreements.

Dynamic Measurement:

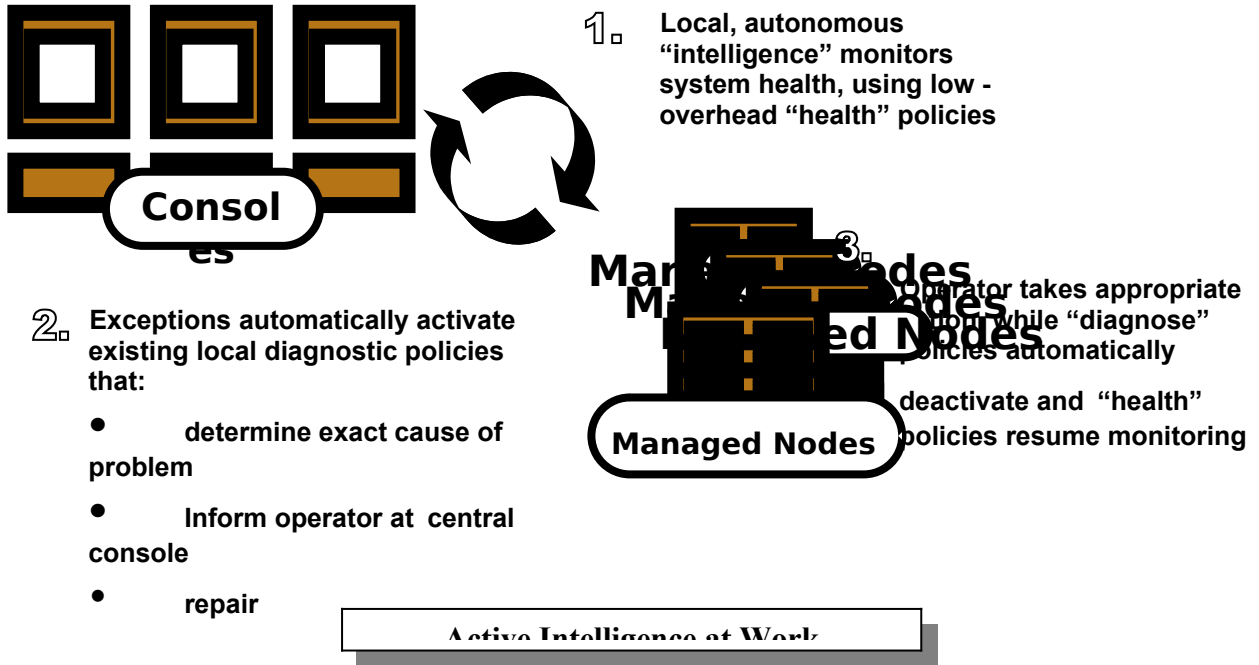
Through a key VantagePoint technology called the measurement engine, the frequency and intensity of data collection can be altered based on the status of the managed service. For example, if the Oracle cache hit ratio has fallen below the defined 20% threshold, active intelligence – without the user's intervention – spawns a more intensive, 10-second interval collection of page-out rates, memory utilization and a list of users making calls.

Guided Root-Cause Impact Analysis & Resolution:

Through the management model and service views, problems can be viewed, in context, to connect a problem with a higher level service. Fixes - in the form of scripts or other applications – can be automatically executed or operator-initiated on a remote node.

Extendable Knowledge Base:

A repository of best practices for solving problems once diagnosed, the VantagePoint knowledge base can be extended by drawing on past IT experiences and importing process management and escalation information.



INSTANT INTELLIGENCE

HP OpenView VantagePoint’s instant intelligence has revolutionized the concept of rapid deployment, automatic configuration, and fast business transaction change management by providing a more nimble and adaptable management tool.

Instant intelligence addresses the following needs:

- Solves the long and elusive problem of IT “service management” realization.
- Helps organizations cope with the rapid and high volume of change in today’s IT environments.
- Reduces the impact of IT skill gaps on the organization by automating business transaction management tasks.
- Automatically discovers business service elements to allow instantaneous views of business services without time-consuming configuration activities.
- Automatically deploys business service policies.
- Automatically detects and fixes problems before they impact a business service.
- Provides “out-of-box” value through pre-packaged Smart Plug-Ins (SPI’s)
- Enables solution extensibility.

INSTANT INTELLIGENCE IMPLEMENTATION

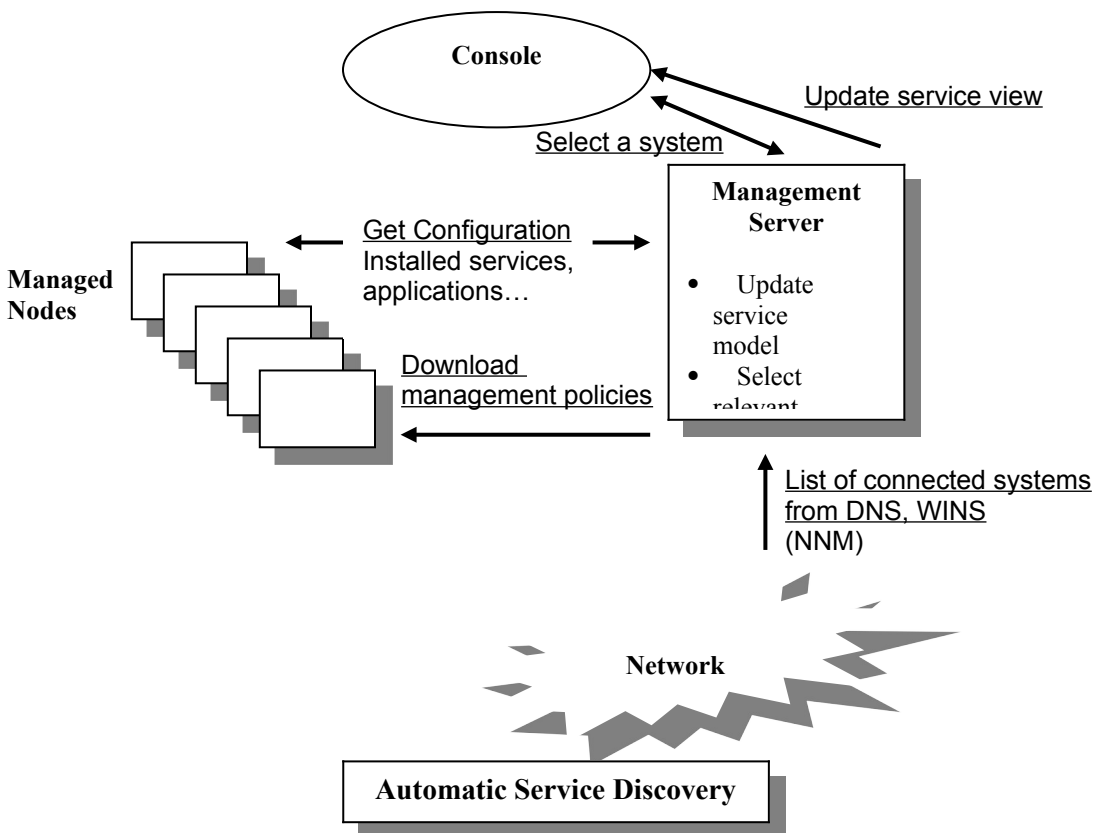
A key development objective of the HP OpenView team was to deliver a solution that would help customers cope with “Internet time” and the sheer speed and volume of changes occurring in their environments. Another goal was to simplify and speed customer and partner deployments of the

management solution itself, while continuing to offer flexibility through HP OpenView's traditional "building block" approach.

The VantagePoint architecture for instant intelligence would need to provide the engineering know-how, technical depth, and breadth of prior HP OpenView solutions, yet have enough built-in management capabilities to enable quick implementation without considerable configuration effort.

Automatic Business Service Discovery:

Through its auto-discovery mechanism, VantagePoint captures the elements of existing business services, along with their element interdependencies. This information is used to initially populate the management model repository. For the leading operating systems, databases and applications, VantagePoint comes with out-of-box capabilities to discover these services' physical components, their hierarchy and inter-relationship across a distributed environment. This greatly reduces the manual effort normally required to create, test and maintain correlation rules.

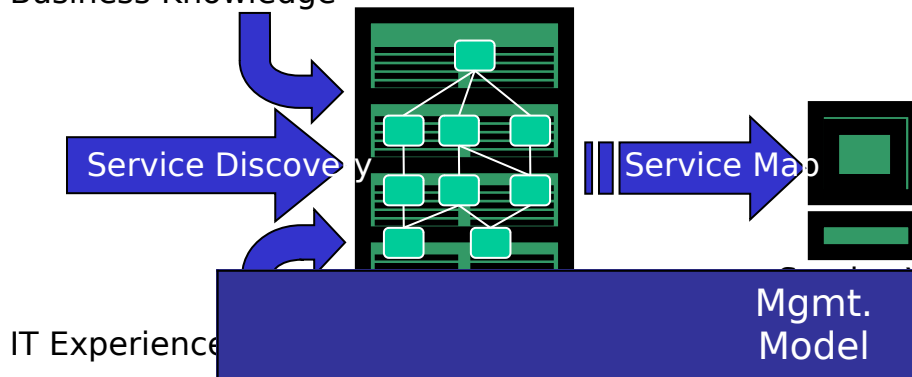


Management Models:

Fundamental to instant intelligence - and enabled by VantagePoint's unique auto-discovery of business services - management models capture and maintain all elements of an end-to-end business service, including the hierarchy, dependencies and relationships between elements in addition to the business rules and service level information contained within IT processes. Management models are stored in an extensible and industry-standard data repository.

Management models learn and adapt based on prior management experience, and adjust automatically and dynamically as components of a business service are added, removed and changed.

Business Knowledge



Graphical Business Service Configuration:

VantagePoint provides a point and click interface to allow administrators to quickly and easily tie discovered IT services with business processes. For example, a set of discovered Microsoft Exchange Servers and their related discovered objects (e.g., CPU, Operating System, Exchange application, etc.) can be linked to an order entry service, an internal mail service for a particular department, or both. Pre-defined policies provide automatic problem detection and evaluation, and allow operator-initiated or automatic response – helping IT departments adapt nimbly to changing business conditions.

Through this graphical configuration tool, or policy editor, VantagePoint gives IT administrators the ability to extend existing - or create new - policies that specify how to monitor and report on service performance and availability. Policies are associated with services in the management model to enable built-in intelligence and automatic mechanisms for service deployment, monitoring, reporting, and management. Policies enable rapid realization of service management by helping IT organizations implement service level objectives (SLOs) on behalf of their business customers, specifically:

- Volume of service to be provided
- Timeliness of the service
- Reliability of the service
- Limitations of the service
- Compensation for the service (if appropriate)

VantagePoint provides a simple way to “codify” these SLOs so they can be automatically tracked, rather than requiring IT operators to mentally map them to the capabilities of various management tools. This “codification” results in the ability for customers and partners to quickly build and deploy custom policies when needed

Auto-Deployment of Policies:

The VantagePoint service broker works in tandem with management model policies to prescribe the agent services to be deployed to a managed object. Rather than deploying a one-size-fits-all agent offering a range of services that often go unused, the types of policies being enacted on the managed node depend on what the policy prescribes. For example, if the objective of management on an Oracle database is limited to historical performance data collection, only

measurement agent services are deployed – leaving behind services that control thresholding, events and actions.

Policy Version Control:

Policy inventory and version control functions assist in tracking and managing which policies are deployed where, in keeping with organizations’ change and configuration management practices.

Smart Plug-Ins:

VantagePoint enables packaging of knowledge about a particular environment in “management modules” known as Smart Plug-Ins (or SPI’s). VantagePoint includes many second-generation SPI’s, as well as new SPI’s for Microsoft Windows 2000/NT, Microsoft SQL Server, Broadvision, and VantagePoint self-management. VantagePoint also enables customers or partners to easily extend their management toolset by custom-developing SPI’s for unique situations.

SMART PLUG-INS.
The first stage of development of the VantagePoint model-driven, component architecture – in essence, pre-packaged management models, complete with policies -- originated in OpenView’s first generation of SMART Plug-Ins (SPI’s). These SPI’s relied on IT/Operations, MeasureWare Agent, or ManageX for infrastructure management. By “plugging into” IT/Operations or MeasureWare, SPI’s extended the OpenView portfolio to encompass targeted database, ERP, Internet and middleware applications. This provided the integrated application management that customers needed. SPI’s created a completely new approach to providing application management by offering out-of-box capabilities at the customer site.

Secondary Solution Goals

In addition to the three primary solution goals, two secondary guiding principles shaped the VantagePoint solution. These were: 1) to provide heterogeneous enterprise environment management from the Windows NT/2000 platform, and 2) to leverage the best of existing HP OpenView enterprise management technologies.

MANAGING E-ENTERPRISES FROM WINDOWS NT/2000

Building a Microsoft technology-based solution was both a requirement and an enabler of the HP OpenView VantagePoint project. Using the latest standards would ensure customer benefits such as ease of configuration and use, accelerated deployment and time-to-value, and compatibility with other management solutions. This approach would also allow customers more flexibility by giving them the choice of managing their enterprise IT environments from the Windows NT/2000 platform, in addition to UNIX platforms.

The primary Microsoft enabling standards used in HP OpenView VantagePoint are:

WMI – Windows Management Infrastructure:

VantagePoint utilizes WMI, Microsoft’s implementation of WBEM (Web Based Enterprise Management), as a common data structure interface. Management models and policy inventory data are stored in WMI, rather than in a proprietary format. This facilitates the necessary

integration of inventory, performance and event data that enables true business transaction and service management. In addition, the use of WMI means that any other management application or Microsoft application can easily import data from, or export data to, VantagePoint. Its self-describing storage mechanisms mean that data can be exported without specialized knowledge of the content or structure of the data. As WMI becomes more prevalent and Microsoft publishes information about their own applications' WMI models, VantagePoint is poised to easily integrate with any other WMI-compliant product (e.g. SQL Server and Exchange Server).

MMC – Microsoft Management Console:

The goal of building an integrated availability and performance management solution required a single management console. The capabilities of MMC provided the greatest flexibility and adaptability in building and providing an extensible console to which other MMC-compliant management capabilities could be added.

The MMC-based console is easy to use. It has the familiar Microsoft look and feel, and utilizes drag and drop capabilities. It allows an operator to visualize and manage the business services in their environment very quickly.

Through MMC “snap-ins”, the management console can be customized with additional management capabilities. This gives customers the flexibility to quickly design a console that meets their unique needs by mixing and matching HP OpenView, Microsoft, or other products. That console can then be distributed to various operators so they each have the consistent tools needed to meet their management requirements.

COM – Component Object Model:

COM - Microsoft's component framework - allows management capabilities to be treated as a set of components that can be installed at runtime, rather than at compile time. VantagePoint is built on this component architecture so that new management capabilities can be added far more efficiently than is currently possible.

The modular nature of the VantagePoint architecture and its rapid development and implementation cycles build on HP OpenView's “Works | Right | Now” strategy, taking the building block approach to an entirely new level of speed and flexibility. For example, partners and customers can develop, test and rollout new SPI's in a fraction of the time previously required.

ActiveX:

By supporting ActiveX, VantagePoint allows partners and customers the choice of several scripting languages, such as Jscript or VB Script, to extend VantagePoint's capabilities.

INTEGRATION AND THE BROADER OPENVIEW PORTFOLIO

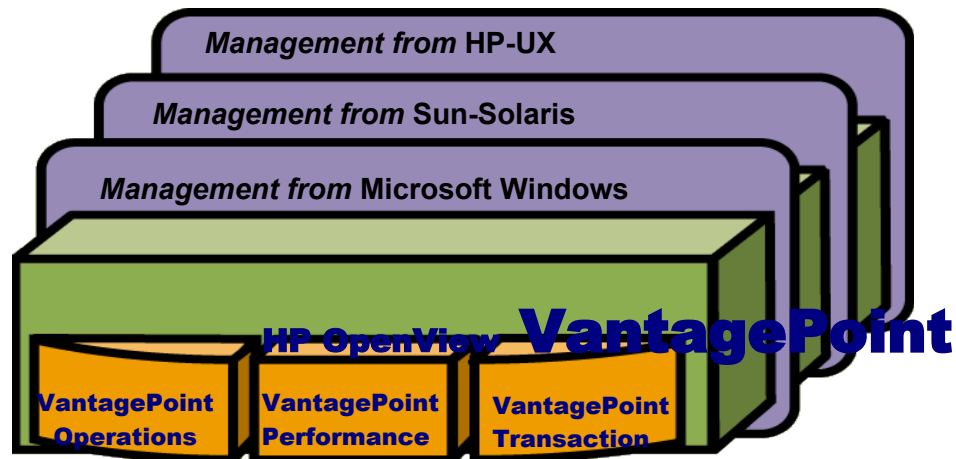
HP OpenView VantagePoint leverages the best of existing OpenView technology by incorporating existing solutions as well as integrating with the broader OpenView portfolio, resulting in a more holistic management system that also dovetails with customers' existing OpenView installations.

UNIFIED AVAILABILITY, PERFORMANCE MANAGEMENT & TRANSACTION MANAGEMENT

VantagePoint unifies the availability, performance and transaction management capabilities that were previously available only by purchasing and implementing individual OpenView products.

SUPPORT FOR HETEROGENEOUS E-ENTERPRISES

VantagePoint supports mixed Windows NT/2000 and UNIX Solaris environments. Customers can choose the unified performance and operations management solution, or purchase the standalone performance or operations management solutions.



INTEGRATED SOLUTIONS

- VantagePoint Navigator
- VantagePoint Reporter
- VantagePoint Web Transaction Observer
- VantagePoint Response Time Workbench
- VantagePoint Event Correlation Services

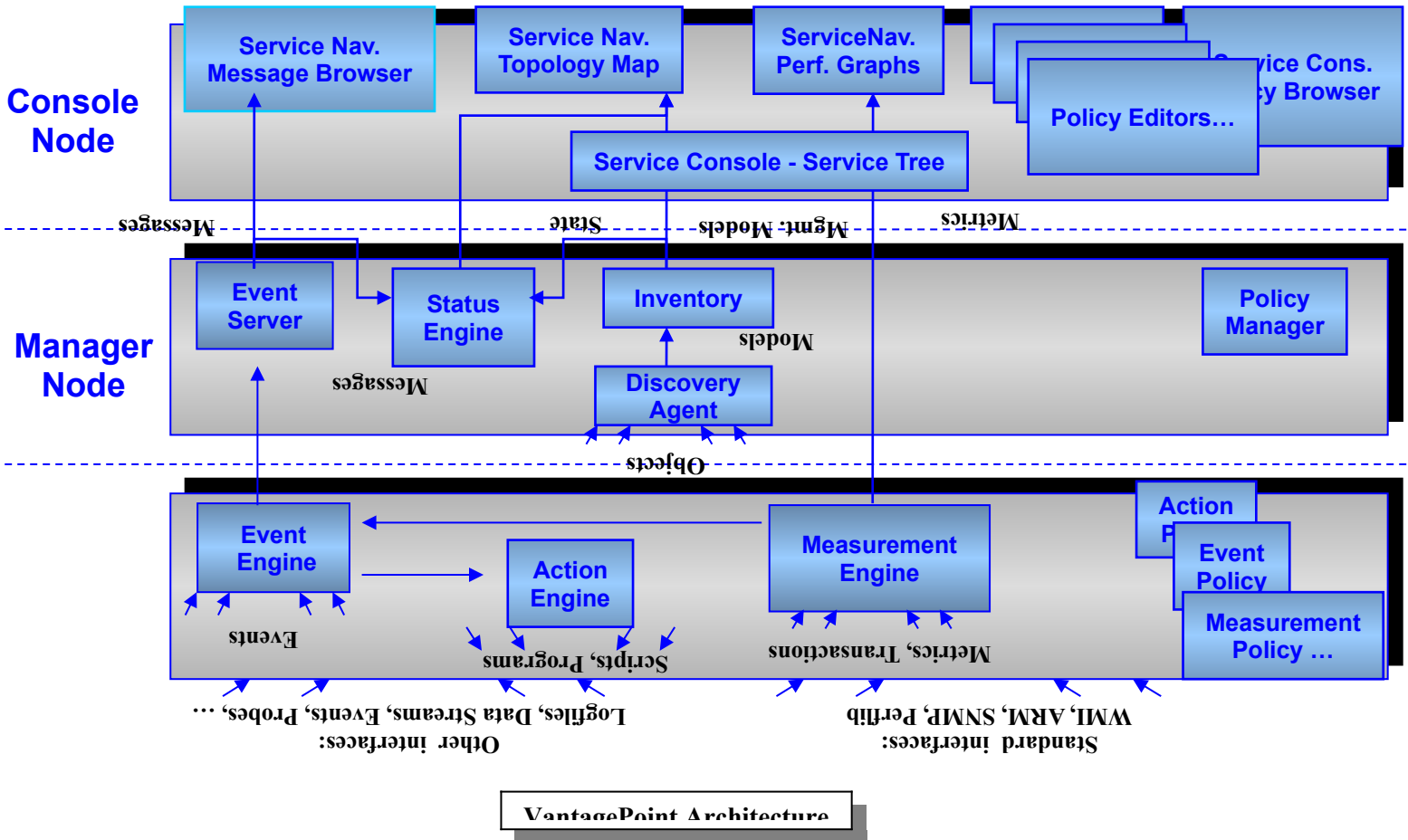
SMART PLUG-INS

VantagePoint provides immediate out-of-box value and extensibility with the inclusion of the following HP OpenView SMART Plug-Ins:

- **New** HP OpenView VantagePoint SPI for Windows NT/2000
- **New** HP OpenView VantagePoint Self-Management SPI
- **New** HP OpenView VantagePoint SPI for MS SQL
- **New** HP OpenView VantagePoint SPI for BroadVision
- *Enhanced* HP OpenView VantagePoint SPI for Microsoft Windows+
- *Enhanced* HP OpenView VantagePoint SPI for SAP R/3
- *Enhanced* HP OpenView VantagePoint SPI for Peoplesoft
- *Enhanced* HP OpenView VantagePoint SPI for Baan
- *Enhanced* HP OpenView VantagePoint SPI for Exchange
- *Enhanced* HP OpenView VantagePoint SPI for Oracle
- *Enhanced* HP OpenView VantagePoint SPI for Informix
- *Enhanced* HP OpenView VantagePoint SPI for Sybase
- *Enhanced* HP OpenView VantagePoint SPI for Remedy

VantagePoint Key Architectural Concepts

In addition to incorporating Microsoft technologies for interface and data storage standardization, VantagePoint's new architecture establishes a revolutionary approach to IT management for the OpenView portfolio. VantagePoint is based on intelligent agents, engines, policies and management models.



Intelligent Agents

The VantagePoint agent is a collection of eight separate components, or "policy types". These policy types incorporate the in-depth performance and availability management functions of the HP OpenView IT/Operations and MeasureWare agents, but also extend the solution with subsequent HP OpenView technical advances in agent ease-of-configuration and deployment.

Any combination of one or more of these eight policy types will be deployed automatically to the managed node in support of the policy that the user wants implemented for that node. Instead of a monolithic, one-size-fits-all agent with a range of services that often go unused, the types of policies to be enacted on the managed node prescribe which agent services to be deployed. Agent capabilities are downloaded to the managed node at the time a policy is deployed to that node to perform some management function.

Key attributes of this new agent technology include:

- Single deployment of the enterprise agent for both performance and event management. Previously the IT/Operations and MeasureWare agents had to be installed separately to provide performance and event management. With VantagePoint, deployment of a single agent reduces the time-to-value of the solution and decreases subsequent management effort.
- Central deployment of the agent from the management server to all managed nodes. Previously, the MeasureWare agent had to be installed on each node individually. With VantagePoint, agent deployment requires no manual intervention.
- Configuration of the agent from a single console and standard graphical interface. Agent configuration is accomplished more quickly and easily.
- Limited configuration required by the customer and more extensive configuration options built in. This reduces the cost and time required to get the solution up and running and provides better information once its running.
- Support for installed IT/Operations or MeasureWare agents. VantagePoint supports previously deployed agents from IT/Operations and MeasureWare, and IT/Operations NT agent templates can be re-used, enabling heterogeneous management from the Windows platform.

Engines, Policies and Management Models

Engines. Representing the lowest level on the architecture scale, the engine is the workhorse in this new paradigm. The three primary engines are a measurement engine; an event engine; and an action engine. Each engine is a generic system management code. The engines contain inert capabilities that are activated by policies. For example, the measurement engine is a generic piece of code that knows how to collect, store, transform and store metrics into useful collections.

One of the most dramatic advantages of the “engine” approach to management is its modular structure. Engines are small and lightweight. New engines can be quickly developed to add new capability. The engines represent a new structure, but they contain the underlying capabilities of the existing HP OpenView availability and performance management solutions.

One exception to this is the measurement engine, which bears a closer look because it offers a significant step beyond what was available with the MeasureWare agent software.

The Measurement Engine. The measurement engine builds on the MeasureWare agent capabilities in that it collects, stores and presents metrics. However, where MeasureWare offered a fixed set of metrics collected at a fixed interval relating mostly to performance of an operating system, the new measurement engine offers greater flexibility in the metrics it collects and the intervals at which those metrics are collected. It can be configured by the customer to collect a wide variety of metrics at a variety of different intervals if desired. Collections can be created that combine as many or as few metrics as is needed, and one light-weight collection can automatically trigger the start of a more detailed collection when more data is needed. In addition, the measurement engine enables derived metrics to be calculated from collected metrics. Finally customers have the choice to use the pre-defined collections that come with the product or customize their own in whatever fashion is needed to monitor their business systems.

Another significant attribute of the measurement engine is that it adheres to industry standards for both input and output. Input metrics are stored in WMI format. Output metrics utilize industry standard OLE/DB. This means that the data can be used by any OLE/DB-compliant product, giving customers greater flexibility to utilize these valuable metrics in other management products.

Finally, the measurement engine will utilize the latest release of the Application Response Measurement (ARM) API, ARM 2.02. Among other capabilities, this new technology enables measurement of Internet-based transactions from the external end user's system.

VANTAGEPOINT AND THE HP OPENVIEW APPLICATION RESPONSE MEASUREMENT API.

HP OpenView pioneered the development of the Application Response Measurement (ARM) API to afford customers and ISV's a standards-based approach to instrument their applications to emit business level response time information. HP OpenView VantagePoint supports the latest version of ARM, and like other OpenView tools is steeped in manipulating, storing and presenting ARM data.

Policies. Policies tell the engines how to operate to solve a particular system management issue such as "monitor CPU utilization". The policy activates the appropriate engines to gather the necessary data or initiate an action to solve the problem. Policies come in a number of categories, such as event policies, action policies, and measurement policies. The policy acts as an instruction set for the engines, so different policies instruct the engines to solve different problems.

The policies describe to the base code engines how to operate in a particular environment. Since the default policies are designed for specific applications, such as an operating system, an email application or an ERP application, the policies identify which engines are needed (e.g. the measurement engine, the event engine, the action engine) and tell the engines what to look for. For example, a policy would tell the measurement engine which metrics to collect, how often to collect them, etc. The policies also contain the information that describes the healthy state of the application, descriptions of problem states and diagnostic information, a list of probable causes of an exception and actions to resolve the issue. Once applied to the inert engine code, the engine takes on the "personality" of the application and provides the management capabilities to support the application and the infrastructure it depends upon.

Policies can be designed at multiple levels. For example, when a threshold is exceeded, the policy that monitors the threshold can be designed to deploy another policy that directs the measurement engine to collect a different metric at a more frequent interval to give the operator additional information about the event. This essentially adds an automatic drill-down capability that is completely new.

The policy system has a number of advantages. One of the greatest advantages is the ease with which policies are created. The Policy Editor is a drag-and-drop operation that enables policies to be built quickly by implementation partners or the customer. This applies to both new types of policies and new policies within a policy type. For instance, the ability to capture SNMP traps is a policy type, and an instance of a policy provides the ability to go after a particular type of SNMP trap. This builds on today's SPI's in that it provides greater flexibility in policy types and the speed with which the policies can be built.

VantagePoint has five fundamental policy types:

- Discovery Policy Type
- Event Management Policy Type
- Measurement Policy Type
- Server Configuration Policy Type
- Unix Connectivity Policy Types

Management Models. At a highest level in this hierarchy are management models, which contain knowledge about specific applications in the customer's service environment. An management model "knows" what the components of a service are, the elements and applications that the service depends on, and the relationship between these elements. For example, a management model for Microsoft Exchange might include an Exchange Server, a database and the data communication between the two.

With this "knowledge", upon deployment the management model auto-discovers all instances of the application and the dependent applications and infrastructure components in a particular environment. From this information, the management model automatically builds a map of the entire service view of the application.

The management model is based on the concept of a Smart Plug-In. Like a SPI, it is "pre-programmed" to know what is important within the service environment, and contains automatic actions that are geared to a specific set of systems and subsystems that the service would need. In addition to understanding all the service elements, the model relates one element to another.

An example is a management model for managing an operating system. There are four basic components to be managed in any operating system: CPU, disk, memory and network activity. The VantagePoint Windows NT management model would therefore know to look for these four elements and would understand the relationship between them, so if an event affected one element, the management model could automatically translate that into an action on another element.

Putting it all Together – A VantagePoint SMART Plug-In Example

In the VantagePoint architecture hierarchy, the next generation of SMART Plug-Ins are an example of the highest level that ties it all together. VantagePoint SPI's are a combination of a management model, a set of policies, and in some instances, additional code to gather unique data. The policies provide instructions for the engines, which are supplied as part of the base VantagePoint product. One of the most significant attributes of these new SPI's is that they not only manage an application service, but they also manage the underlying infrastructure in a way that is transparent to the user.

For example, a Microsoft Exchange SPI will deploy the Exchange model that discovers the instances of Exchange in the environment as well as the dependent infrastructure elements. The model consists of the policies needed to engage the measurement engine, the action engine, and the event engine, provide monitoring, thresholding, event logging, and corrective actions specifically targeted to Microsoft Exchange. But this level of complexity is completely transparent to the user. Simply deploy the Exchange SPI to the node that contains the Exchange server and the SPI deploys itself as needed. The only interaction is with the management model and the policies related to managing Microsoft Exchange. Availability, performance, and application management are integrated, with any complexity masked beneath an intuitive interface.

Service views are an intrinsic part of this modular SPI approach. In the very simplest case, a service has a one-to-one correspondence with an application. For instance, a database management SPI would have one service to manage – the database. However, a complex ERP application such as SAP has multiple services that the line of business manager must track such as order processing or inventory management. Since the model describes the infrastructure components needed and provides the relationships between them, individual services will be built into the model so that the collected metrics and events are automatically correlated and displayed into service views.

This is a revolutionary approach that has dramatic implications for simplifying business transaction management. First, it shifts the focus from managing the infrastructure to managing the service. Rather than needing to implement a network management solution and then a systems management solution, then an application management solution, it is a simple matter to implement a Microsoft Exchange or SAP R/3 management solution that also takes care of the underlying infrastructure. Configuration is simplified since the SPI comes with the majority of the configuration built in and the service view is automatically generated because the SPI has already identified the infrastructure elements it depends upon. For both the business manager and the IT manager, this approach provides tremendous simplification of the IT management process by slicing the infrastructure horizontally along the application/service path rather than vertically along the lines of infrastructure silos.

The component nature of the SMART Plug-In approach enables creation of new SMART Plug-Ins without the need to change the product infrastructure. This will result in dramatic cost and timesavings to implementation partners and customers in customizing their solution.

Conclusion

VantagePoint is a revolutionary solution for customers who view business transaction management and service provisioning as a strategic initiative. Built as application/service-oriented modules, VantagePoint will provide far greater overall flexibility, be simpler to use and customize, and operate as a single, unified solution. By using Microsoft technologies at the primary interfaces, VantagePoint not only provides an enterprise management solution for managing heterogeneous environments from the Windows NT/2000 platform, but also makes use of emerging de facto standards for enterprise management software.

Additional Information

Please visit the HP OpenView web site at <http://www.openview.hp.com> for more information about the HP OpenView VantagePoint solution.