MANAGE AND CONTROL IT SERVICES IN THE AGE OF COMPLEXITY.

Business white paper

Executive summary

In a world of mobility, virtualisation, and cloud computing, IT services are constantly changing. They may even be delivered by a third-party vendor rather than the IT organisation responsible for the health of the overall service. This only exacerbates the operational challenges that IT faces today. To serve the business more effectively, IT needs a new approach to managing operations. Call it the new business service management (BSM) – where the emphasis is on the management of business services in a unified manner regardless of where those services originate.

Service health in the age of mobility, virtualisation, and cloud computing

As the pace of business accelerates, companies everywhere are demanding more from IT – such as faster service delivery with lower risk and higher quality of service. To meet these expectations, IT must evolve.

Much of this evolution involves embracing technologies such as mobility, virtualisation, and cloud computing. Instead of building everything in house, IT today finds itself in the business of procuring technologies from a host of providers, integrating them within the existing infrastructure, delivering the end-to-end service to various constituents, and managing it all in a way that ensures the highest possible service levels. While this dynamic new world helps increase business agility, it also increases IT complexity and rate of change, making the smart management of IT operations more important than ever.

Some organisations move parts of their infrastructure to the cloud to simplify their environment or reduce costs, but the fundamental principles of management remain: Monitor the entire IT hybrid environment from applications through infrastructure. Consolidate and correlate events to find, identify, and correct problems. Apply intelligence to visualise, forecast, and plan resource consumption while meeting service level agreements.

Rather than focusing on applications and business services, however, the prevailing approach to IT operations continues to focus on the performance of infrastructure components, often in individual silos. This approach depends largely on manual process and the use of non-integrated tool sets that impede cross-silo collaboration and create serious inefficiencies among teams responsible for IT operations. In this context, the end-user experience is often overlooked, and IT has limited means for connecting underlying infrastructure technologies to the business services they support.

Adapting to a constantly changing IT environment – while also meeting the needs of business and end users – requires a new approach to managing operations. The methodology that has emerged to fill this vacuum is called business service management (BSM). BSM focuses on connecting services to the underlying IT infrastructure regardless of provider, addressing issues before they impact business, improving overall service quality, and providing better visibility into onsite and cloud services.

Figure 1. HP BSM provides up-to-date performance and SLA views for physical virtual, mobile, and cloud-based services.

The new BSM requirements

Today's IT organisation needs an integrated BSM model that combines a top-down and bottom-up approach to monitoring and spans mobile, physical, virtual, and cloud-based environments. The goal is to manage every element of the service – including infrastructure, applications, transactions, end-user experience, virtualisation technology, and services delivered via the cloud.

In practical terms, this requires a consolidated operations console that can help IT track and respond to infrastructure events occurring on the ground floor of IT (bottom up) and maintain service health in real time by monitoring the end-user experience (top down). This can enable IT to meet increasingly demanding service level agreements and constantly evolving business needs.

In addition, the complexity of hybrid IT environments requires a new level of intelligence at the business service level. This allows IT executives to analyse and model business services across disparate, heterogeneous IT domains and use historical data to optimise resource consumption and plan for future growth. Service intelligence is about turning all the various types of IT data into actionable knowledge. The next frontier of IT tools will provide an analytics engine that can anticipate IT problems before they occur, allowing IT to work smarter.

Connecting all the monitoring, consolidation, and reporting layers requires an accurate, up-to-date service model that can automatically keep up with changes in a dynamic environment. Frequent changes also require extensive automation to reduce the time-consuming labour involved.

A dynamic environment requires a run-time service model.

Think of a service model as a map that displays all of the technology components associated with any service you run. Components can include transactions, applications, Web servers, network switches, virtualised components, hybrid cloud services, and events from third-party monitoring tools. This model plays a critical role in effective business service management because when an application or transaction problem occurs, it can help you quickly identify the infrastructure components that may be playing a role in service disruptions. The service model also helps IT operations perform quick impact analysis in the event of an infrastructure or application issue.

But why make it run-time? Because in the virtualisation and cloud-computing era, service infrastructure is constantly changing. That's why it's imperative to ensure the 'currency' of this service model on a continuous basis so that an accurate service definition can be used to troubleshoot service problems and manage service level agreements.

As no organisation can be expected to keep a constantly evolving service model up to date manually, automatic discovery is an essential capability. Here, non-intrusive probes can be used to automatically detect infrastructure, application, and transaction changes in near real time – much the same way that a personal computer identifies newly added peripherals. An IT infrastructure that includes composite applications is far more complex, so automatic discovery capabilities need to be broad enough to cover all relevant domains within the infrastructure – from applications to servers to the network itself. This serves as the foundation on which effective BSM is built.

Automation lowers cost and increases response times and control.

HP estimates the average cost of manually handling a single application incident to be around US$75 (not including the end-user impact of application downtime). For organisations that manage thousands of events and incidents each day, the costs can quickly add up. With the onset of virtualised and cloud services, not only will the number of application incidents increase, but the complexity of these services will also increase the cost of managing these incidents.

Hence, the importance of automating routine IT tasks such as incident management and issue resolution. Here, a consolidated operations console and a run-time service model play a central role. With a consolidated operations screen, all events are sent to a single console where they are automatically correlated. They are then analysed according to the run-time service model to determine the underlying causal event and prioritised based on the impact to the business. The key to success is having a single universal event-correlation tool that consolidates across all various IT element monitoring tools and correlates based on a dynamic real-time model.

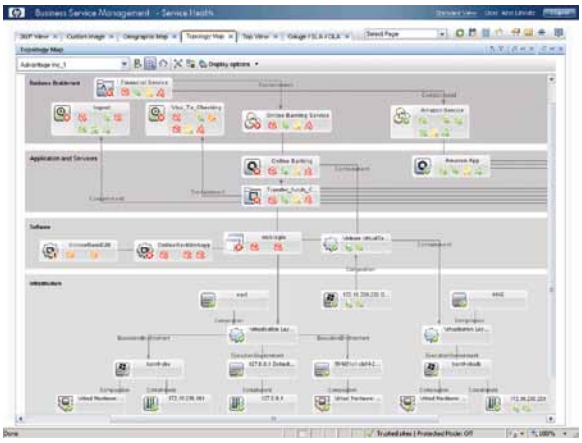
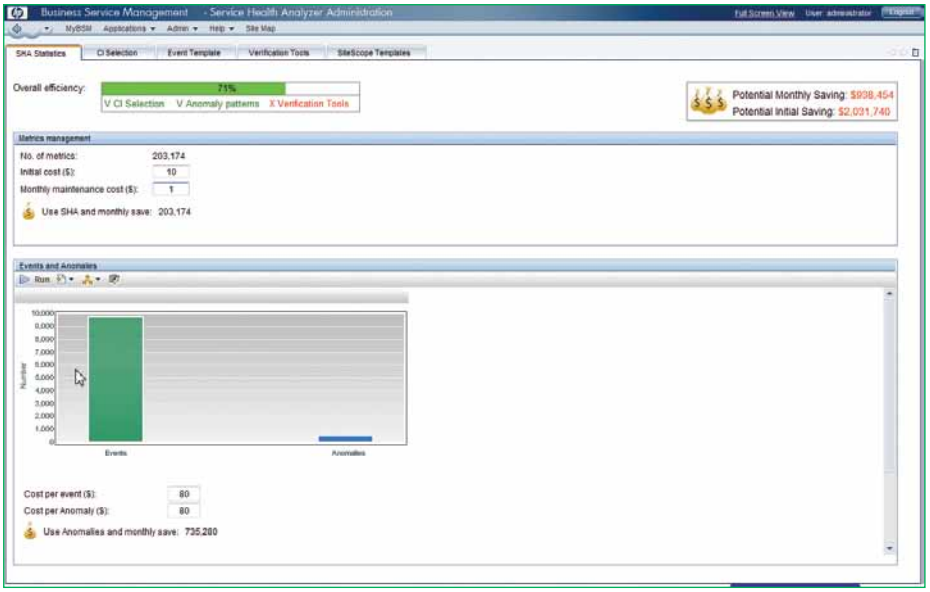


Figure 2. HP BSM Run-time Service Model provides comprehensive, automated, and accurate service maps to drive effective service operations.

Figure 3.
HP Service Health Analyzer anticipates real IT issues and calculates ROI based on historical data.



IT operators and subject matter experts often use tools such as Microsoft® System Center Operations Manager (SCOM) or Nagios® to monitor various aspects of the IT environment. These disparate tools may be essential for a particular function, but many times the information they provide is not consolidated with other tools. This adds to the difficulties IT faces with gaining visibility into the end-to-end health of a service.

To manage the overall service, it's key to consolidate and correlate events across all tool sets. Using run-book automation, you can then launch an automated workflow that runs through the procedures to resolve the issue without human intervention. Where issues do require human intervention, a ticket is automatically generated that is enriched with state information, as well as relevant context and historical data. This helps to speed response times and increase staff productivity by allowing engineers to manage by exception – focusing on only those issues that demand their attention.

Automation also helps ensure consistency and control by enforcing policy-driven approaches to issue and problem resolution. Removing the human factor from lower-level issues and routing enriched ticket information to the appropriate parties for rapid resolution can vastly reduce errors while eliminating confusion that arises from duplication of effort. The end result is greater compliance with established IT governance policies and an improved ability to follow through on service level agreements.

Service intelligence converts data into actionable knowledge.
Service intelligence refers to the value-added layer that allows lines of business and IT to focus on business services rather than the underlying environment. This is a key component of tracking service level agreements. While IT domain owners have long had the ability to report on the availability and performance of their domains, IT executives now need to report on overall service health across the multiple technology silos involved in delivering critical business services.

As IT infrastructures grow more complex, especially with the additional abstraction layers of virtualisation or cloud-based services, it becomes increasingly difficult to map the impact of infrastructure performance on business service performance. Two challenges include providing the proper context around any individual IT element and understanding the impact of changes or outages on business services. Fortunately, both of these issues are resolved by the information in the run-time service model.

Actionable reports rely on good data. The business service intelligence layer requires accurate and up-to-date information about the availability and performance of the infrastructure and applications, even as it changes when virtual machines are moved around. The business context comes from the relationships stored in the run-time service model. The run-time service model connects business service end-user experience measurements to the underlying infrastructure resource metrics for performing impact analysis.

To achieve the agility and cost savings that virtualisation and cloud computing offer, IT needs the ability to combine historical and performance data with usage forecasts to visualise, optimise, forecast, and plan workload placement and future infrastructure investments. The dynamic relationships among virtual guests, physical hosts, cloud services, and the business services they support must be included in the planning activities. Correlating and mapping these elements is beyond any one person or department; it requires business service intelligence.

Certainly, IT would like to spend more resources on innovative initiatives like mobility, cloud, and virtualisation, but it is overburdened with day-to-day operations. IT organisations must often squander cycles on keeping thresholds current – and this is only accentuated in dynamic virtual environments. Keeping pace with change requires a tool capable of automatically capturing and establishing thresholds based on actual changing environments, thereby reducing the number of alerts. However, reducing the number of alerts is only one part of the equation.

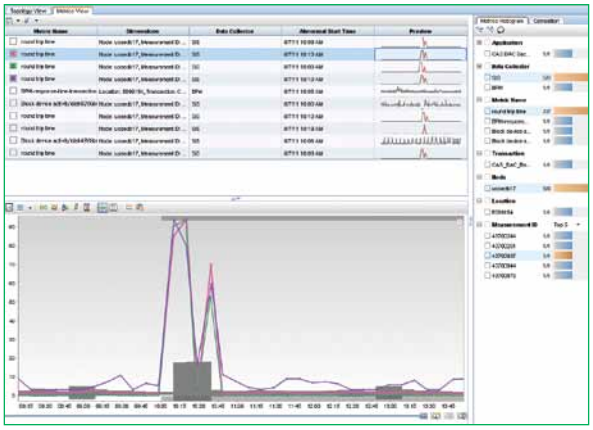


Figure 4. HP Service Health Analyzer analyses information from the Run-time Service Model.

Determining which of these events requires immediate action is crucial as well. By building dynamic thresholds for the time of day and the day of week based on historical norms, IT now has the power and insight to quickly identify potential performance issues and take action. This new era of analytics allows IT to anticipate, prevent, and remediate IT incidents before they impact the business.

Meet the real-world needs of IT and end users with collaboration and integration.

With multiple people, processes, and tools involved, IT must collaborate to quickly manage new services and track and maintain service health. Doing so requires integration, collaboration, consolidation, personalisation, and the ability to deliver information on the go, regardless of its source.

As the rate of change and the adoption of new technology increase, IT is expected to manage new applications and services in a timely fashion – with little to no knowledge of them. Having a common tool set allows developers and operators to share knowledge, scripts, best practices, and user behaviour to improve the overall performance of the delivered service. By collaborating with the application development group earlier in the development lifecycle, IT can ensure monitoring requirements are built into the application and that IT is ready to manage the application from the day it goes live.

Consolidated event management, for example, provides a single source of truth (SSOT) for what's happening in the infrastructure at any point in time. Instead of multiple teams chasing the same event from different perspectives, IT can quickly pinpoint the cause of a problem, search and analyse log files as needed for additional information (such as security context), determine the potential business impact, and open an incident ticket in the service desk solution. The service desk then quickly routes the problem to the group that can best address it. This helps improve IT productivity and ensure high levels of services. It also provides IT with security details, helping to bridge the gap between the network operations centre (NOC) and the security operations centre (SOC).

Based on this SSOT, information needs to be delivered in a context appropriate to the role consuming it. This requires personalisation. Line-of-business managers may want information concerning the value of transactions while IT operators may seek early warnings about failing network components to fend off potential service disruptions.

Increasingly, this information must be delivered to a workforce and customer base that are on the go and embrace collaboration through social media. Take, for instance, hardware engineers who spend most of their time roaming the data centre. These engineers could receive alerts via a mobile device, saving time by eliminating trips back and forth to their desks. The same could be true for line-of-business managers tracking transactions while on the road. Or consider the IT operator who would benefit from collaborating with other functional experts in a live, real-time manner. Whatever the specific scenario, IT needs the ability to deliver the right information to the right people where and when they need it, regardless of the devices they use to access that information.

Monitor, report, and optimise business services for the hybrid cloud and mobile applications.
Virtualisation technology and cloud computing improve IT's ability to flex capacity to meet demand, but they also take direct control of infrastructure resources out of IT's hands. This is why it's more important than ever for IT to monitor service health from the perspective of the end user. At a time when data centres are based on a combination of physical and virtual/cloud infrastructure, end-user monitoring can help IT manage both in a unified manner.

With the groundwork laid as previously discussed (consolidated operations bridge, run-time service model, automated IT processes, and more effective collaboration), IT can use end-user monitoring to quickly respond to issues. By supporting heterogeneous infrastructures and the comprehensive management of virtualised services, for example, end-user monitoring can help IT supervise target service levels. When performance drops below predefined thresholds, IT can trace the problem back to its source for rapid resolution. For outsourcing scenarios such as applications running in Amazon EC2 or Microsoft® Azure™ environments or services delivered by a software-as-a-service (SaaS) provider, this helps minimise risk by giving IT an effective way to track whether external service providers are meeting their commitments.

As with cloud and virtualisation, another mega-trend emerging is the ability to access applications and perform transactions from mobile devices. Businesses may be rapidly adopting new mobile applications to reach new markets and consumers, but customer expectations remain the same: They demand a consistent, high-quality service experience. Once again, IT is faced with managing services delivered through new technologies that add a new layer of complexity. To overcome the challenge of managing new mobile business services, IT needs visibility into the ways that end users experience the mobile application. IT can then apply this insight and knowledge to the back-end application delivery chain, allowing them to isolate issues quickly and provide a high-quality service and experience.

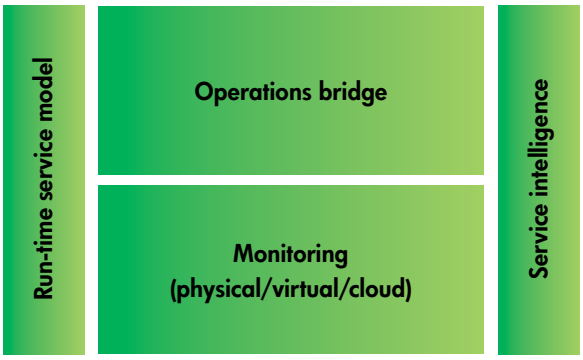


Figure 5. HP BSM components

The dynamic nature of virtualisation and cloud computing is evolving the IT environment at an unprecedented rate of change. HP Software and Solutions is uniquely positioned to help IT rise to the challenge with HP Business Service Management 9.10. HP BSM 9.10 is comprised of the following solution capabilities – each designed to play a role in your success.

HP Run-time Service Model
The HP Run-time Service Model (RTSM) serves as the engine for HP BSM by providing a dynamic real-time business service model/topology. RTSM delivers the unique ability to capture and leverage data collected from a variety of real-time data sources and apply it to the challenges of maintaining service health, event correlation, and application management in a dynamic enterprise.

HP Service Intelligence
HP Service Intelligence uses the information gathered from RTSM to understand what happened at the business service level, and then analyses that data to create actionable intelligence. With HP Service Intelligence, you'll have the analytics to help you understand the past, optimise the present, and anticipate the future.

- **Service Health Analyzer (SHA):** SHA anticipates IT problems before they occur by analysing abnormal service behaviour and alerting IT managers of real service degradation before it impacts the business. SHA is the industry's first predictive analytics tool built on top of a real-time, dynamic service model to correlate metric abnormalities with topology. This information, along with advanced analytics and sophisticated algorithms, enables SHA to forecast future problems and prioritise those issues based on business impact.
- **Service Health Optimizer (SHO):** SHO provides recommendations to optimise your hardware resources though efficient capacity planning management and workload placement from an overall business service perspective. SHO allows you to visualise what you have, what you use, and what can be improved in your virtualised environment.
- **Service Level Management (SLA):** SLA tracks and reports application health and SLAs in terms the business understands. It allows you to observe application health, track and report on business objectives and SLAs, and see the monetary impact of business issues. SLA is a single console to the health of the service, on- or off-site or in the cloud.
- **Service Health Reporter (SHR):** SHR improves business service performance through a cross-domain reporting tool. SHR is a single screen tool that allows you to correlate relationships between business services and the infrastructure, so you can identify changes in dynamic environments, forecast metrics, or trends, and customise reporting.

- **ArcSight Logger:** It unifies searching, reporting, alerting, and analysis across any type of enterprise log data, making it unique in its ability to collect, analyse, and store massive amounts of data generated by modern networks. ArcSight Logger supports multiple deployment options and can be deployed as an appliance and as software. It integrates with HP Operations Manager, HP OMi, and NNMi, giving IT operators universal event logging for faster triage and event enrichment.

HP Operations Bridge

- **Universal Event Correlation:** HP Operations Manager i (HP OMi) easily identifies the cause of an incident, which can be difficult and complex in virtualised and cloud environments. HP OMi automatically correlates and consolidates events from different domains and disparate element managers based on the HP Run-time Service Model.
- **Dashboards and Service Health:** These provide a 360 degree view of business services and their underlying IT dependencies. Out-of-the-box and customised views are designed to make operational workflows easier to follow, allowing IT to have the right context for the right role at the right time.
- **Run-book Automation:** Fix issues in an automated fashion without impairing the business service and with no manual labour. This helps IT to speed response times and increase staff productivity by allowing engineers to manage by exception – focusing on only those issues that demand their attention.

Monitoring

- **Systems Management:** HP Operations Center helps you monitor, diagnose, and prioritise infrastructure problems based on business impact and supports consolidated operations. An integrated operations bridge consolidates event and performance data from physical, virtual, and cloud sources to reduce duplicate monitoring and boost productivity.
- **Network Management:** HP Network Management Center software supports an integrated, holistic lifecycle approach to network management – one that leverages automation to drive down costs, improve compliance, and increase IT efficiency. You can unify fault, availability, and performance capabilities with change, configuration, and compliance while automating the technology process workflow across these capabilities.
- **Application Performance Management:** HP Business Availability Center serves as a comprehensive application management solution for applications deployed to mobile, physical, virtual, and cloud environments, helping you to proactively identify and resolve problems quickly and efficiently. Allowing 360 degree monitoring of critical business transactions and management of business service health from the end-user perspective, this software helps reduce downtime and improve the quality of service by improving availability and performance.

To find out more about HP Business Service Management 9.10 please visit **http://www.hp.com/go/bsm**.

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