

Technical Brief

Systems Management



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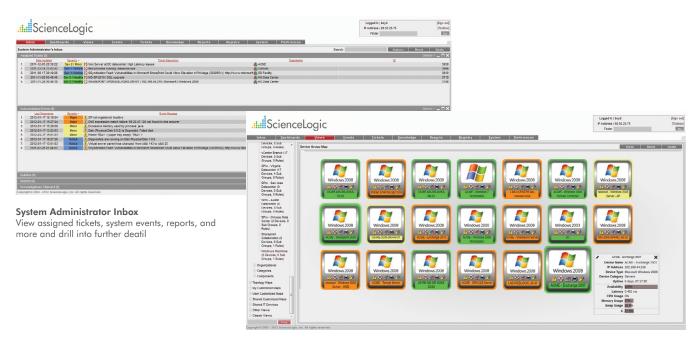


Introduction—About this Technical Paper

ScienceLogic's all-in-one platform delivers fully-featured systems management functionality across both physical and virtual servers in a single solution for the data center and the cloud. Supporting multiple operating systems ScienceLogic systems management instantly collects asset and configuration information as well as availability and performance metrics for real-time fault management and views. Intelligent reports on historical trends aid in troubleshooting, capacity management, and overall proactive management of all systems on the network. Fully integrated with ScienceLogic's monitoring of other critical IT infrastructure components, ScienceLogic systems management enables you to boost the performance and availability of all applications and IT services running in the data center or in the cloud — resulting in fewer service disruptions for users.

Dynamic Discovery

Given a range of IP addresses and credentials to collect data, the ScienceLogic system initiates automated discovery sessions, both scheduled and on-demand, to begin modeling the physical and virtual servers running on the network. Going far beyond auto-discovery, ScienceLogic's Dynamic Discovery is an intelligent process that identifies the server make, manufacturer, model, and what is running on the server (operating system, application, database, etc.), and then automatically applies the appropriate ScienceLogic PowerApps (pre-built management templates based on best practices, or custom-built device management templates) to immediately begin pulling critical configuration, availability, and performance data.



At-a-glance status of all Windows devices, and quick navigation into any specific device



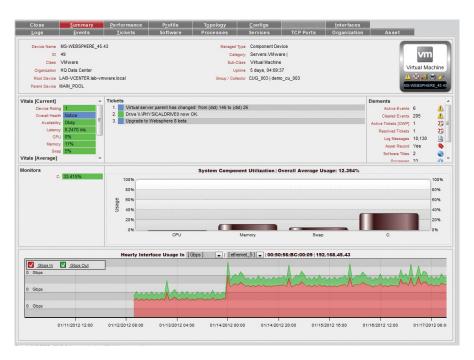
Integrated ScienceLogic Fault Management

The ScienceLogic all-in-one system includes fully-featured fault management capabilities. Events can be sent to the ScienceLogic system by third-party systems via syslog messages, SNMP traps, SNMP informs, and emails. The system can alternatively send traps to a Manager of Managers (MoM). Users are able to set alerts against customizable threshold values (including "dynamic" thresholds), an illegal (Windows) service that is running or one that stops running, or upon changes to configuration values.

Based on the relationships discovered between devices in Dynamic Discovery, the system automatically and intelligently builds and continues to update topology maps showing connections which are then used for event correlation and suppression to prevent event storms.

Devices may also be connected manually to create parent-child relationships that aid in correlation and suppression. Users can easily customize notification and escalation policies for events, and use the integrated run book automation features to automate remediation where appropriate — such as, to open a ticket (within the ScienceLogic system or in a third-party ticketing tool), restart a service, set a value, kick off a script, and more.

Using the same central data repository, ScienceLogic integrates fault management with availability and performance management in a single solution — driving rapid troubleshooting along with integrated reporting for management.



Device Summary View

Device status and health at-a-glance, plus related events and tickets in a unified view



ScienceLogic Systems Management Features — At a Glance

Manage multiple operating systems: Windows, Linux, SunOS, HPUX, IBM, AIX, z/OS, OS X, Netware, SCO, and more...

Automatically monitor CPU, Memory, File Systems, Swap, processes, software inventory, system latency and availability, hardware components, and more...

Compatible with third-party hardware agents such as Dell OpenManage, IBM Director, HP Insight Manager, SUN Enterprise Agents, SystemEdge Agents, SNMP Informant, and MS Windows

Compatible with open source agents, such as UCD-SNMP and NET-SNMP

Supports multiple credentials to collect data from multiple agents deployed on a single device

Integrated device management toolbox allows administrators to securely and remotely run common troubleshooting tools: trace route, DNS lookup, PING, Port PING, web check, SNMP walk, and ARIN IP space lookup

Device Summary displays at-a-glance view of system health and performance with associated events and tickets

Customizable inbox and dashboards of relevant system health, events, and reports

Hundreds of built-in Dynamic Applications best-practices-based monitoring policies — Windows, Linux, VMware, and more

Automated inventory of installed software (including Windows Service Packs and Hotfixes), running processes and services, and open TCP ports

Integrated Run Book Automation features for automated remediation or third party systems integration

Hundreds of reports out-of-the-box, plus a custom report writer. Sample Reports include: Device Availability, Device by Monitored Service, Device Top Utilization, and Device Utilization Trend



ScienceLogic Management Templates

Every ScienceLogic system includes hundreds of management templates based on best practices for leading manufacturers' equipment and applications. Out-of-the-box, these management templates instantly build a complete and detailed picture of system health, for real-time and historical views and reports.

Systems monitoring policies — defined in ScienceLogic PowerApps and device management templates — can easily be customized for thresholds, events, polling frequency, device characteristics, etc., for bulk device management or down to a specific server. Data can be collected at intervals ranging from 1 minute to every 24 hours, according to an organization's specific needs. With operations automation at the heart of the ScienceLogic platform, performance and availability metrics are pulled immediately after the Dynamic Discovery process, usually within minutes of initiating the discovery, so that system administrators get the data, alerts, reports, dashboards, and more that they need to do their jobs.

ScienceLogic management templates use a variety of protocols to communicate with servers on the network and pull back requested data, including SNMP, XML/SOAP, WMI, and even custom scripts via the ScienceLogic Snippets feature for non-standard interfaces, or where a level of pre-processing or access control is required to collect data.

An intuitive GUI makes it easy for users themselves to customize the management templates or to create new ones — thereby eliminating the need to be a developer or to pay for outside professional services. Unlike competitive solutions, ScienceLogic puts the power in the hands of the users to deploy custom monitoring on their own schedule instead of waiting for the vendor to develop support around a specific device or application.

Pre-built management templates are bundled in ScienceLogic's PowerApps, along with applicable dashboards, events, reports, and automation actions — everything you need to get started instantly out-of-the-box. Integrated into every ScienceLogic solution is the ScienceLogic Core PowerApp. Over 1,000 ScienceLogic PowerApps are available, and additional advanced PowerApps continue to be developed for particular manufacturers and technologies.



ScienceLogic Power-Packs

Customize or build new management templates easily within ScienceLogic



ScienceLogic Systems Management—Availability & Performance

Windows

ScienceLogic provides complete visibility into the availability and performance of your Windows operating system and underlying hardware. The ScienceLogic platform can monitor Windows 2003, Windows 2008 Server, and Windows 2012 Server as well as desktop operating systems like Windows 2000 Workstation, Windows XP, Windows Vista, Windows 7, and Windows 8. The platform can also aggregate hardware configuration and performance information made available from hardware agents like HP Insight Manager, IBM Director, and Dell OpenManage.

- Systems Availability and Latency
- System Uptime
- System Restarts
 - Processor Configuration and Performance
 - Number of CPU
 - CPU Utilization
- Memory Configuration and Performance
 - Physical Memory
 - Physical Memory Size
 - Physical Memory Used
 - Physical Memory Utilization
 - Virtual Memory
 - Virtual Memory Size
 - Virtual Memory Used
 - Virtual Memory Utilization
- File System Configuration and Performance
 - File System Inventory
 - File System Utilization
 - Network Interface Configuration and Performance
 - Interface Type
 - MAC Address
 - Connection Speed
 - IP Address
 - Subnet Mask
 - Interface Utilization
 - Inbound and Outbound Utilization
 - Inbound and Outbound Errors
 - Inbound and Outbound Discards
 - Average Utilization
 - Normalized Utilization by Hour and by Day
 - Comprehensive Utilization

- Hardware Configuration and Performance * (see below)
 - HP Insight Manager
 - IBM Director
 - Dell OpenManage
- System Process
 - System Process Inventory
 - Process Name
 - Process Argument
 - Process User
 - Memory Limits
 - Minimum and Maximum Instances
 - Verify Processes are Running
 - Verify Processes are not Running
- System Services
 - Service Inventory
 - Service Name
 - Run State
 - Verify Services are Running
 - Verify Services are not Running
 - Service Actions * (see below)
 - Automatically Start, Stop, Pause, or Restart Service
 - Automatically Reboot or Shutdown System
 - Execute a Script Stored on the Local Host
- TCP Ports
 - Inventory Open TCP Ports
 - Verify TCP Port Availability
- Software
 - Software Inventory
 - Software Title
 - Installation Date
 - Generate a Software Exclusion Report
- VMware * (see below)

^{*} Service actions require the OS agent be installed on the monitored system



ScienceLogic Systems Management — Availability & Performance

Linux/UNIX

ScienceLogic provides complete visibility into the availability and performance of your Linux and Unix operating systems. By leveraging Net-SNMP, the ScienceLogic platform can monitor numerous Linux-Unix distributions. ScienceLogic can also aggregate hardware configuration and performance information made available from hardware agents like HP Insight Manager, IBM Director, and Dell OpenManage.

- Linux (kernels 2.6 to 1.3)
- Solaris/SPARC (11 to 2.3)
- Solaris/Intel (10, 9)
- HP-UX (10.20 to 9.01 and 11.23 to 11.0)
- Mac OS X (10.4 to 10.1)
- NetBSD (2.0 to 1.0)
- FreeBSD (6.1 to 2.2)
- OpenBSD (4.0 to 2.6)

- BSDi (4.0.1 to 2.1)
- AIX (5.3, 5.2, 5.1, 4.3.3, 4.1.5, 3.2.5)
- IRIX (6.5 to 5.1)
- OSF (4.0, 3.2 and Tru64 Unix 5.1B)
- SunOS 4 (4.1.4 to 4.1.2)
- Ultrix (4.5 to 4.2)
- Dynix/PTX 4.4
- QNX 6.2.1A

- Systems Availability and Latency
- System Uptime
- System Restarts
 - Processor Configuration and Performance
 - Number of CPU
 - CPU Utilization
- Memory Configuration and Performance
 - Physical Memory
 - Physical Memory Size
 - Physical Memory Used
 - Physical Memory Utilization
- Swap Memory
 - Swap Memory Size
 - Swap Memory Used
 - Swap Memory Utilization
- File System Configuration and Performance
 - File System Inventory
 - File System Utilization
- Network Interface Configuration and Performance
 - Interface Type
 - MAC Address
 - Connection Speed
 - IP Address
 - Subnet Mask
 - Interface Utilization
 - Inbound and Outbound Utilization

- Inbound and Outbound Errors
- Inbound and Outbound Discards
- Average Utilization
- Normalized Utilization by Hour and by Day
- Comprehensive Utilization
- System Processes
 - System Process Inventory
 - Process Name
 - Process Argument
 - Process User
 - Memory Limits
 - Minimum and Maximum Instances
 - Verify Processes are Running
 - Verify Processes are not Running
- TCP Ports
 - Inventory Open TCP Ports
 - Verify TCP Port Availability
- Software
 - Software Package Inventory
 - Package Title
 - Installation Date
 - Generate a Package Exclusion Report
- Hardware Configuration and Performance* (See below)
 - HP Insight Manager
 - IBM Director
 - Dell OpenManage

^{*} Hardware agents may not be compatible with all distributions of Linux/Unix.



ScienceLogic Asset and (Hardware) Configuration Management

Asset records for physical servers are automatically created during Dynamic Discovery and updated on an ongoing schedule. The ScienceLogic all-in-one solution includes management templates that pull detailed hardware configuration information, such as serial numbers or amount of installed memory, directly from manufacturer devices. Asset records are customizable, and they serve in the capacity of a centralized repository for additional information, such as vendor service/warranty contracts and service expiration dates which may be set up as an alert within the system. Alerts may also be set up for configuration changes and remote physical management. For example, a change to the amount of installed memory on a machine can trigger an alert to the system administrator.

The ScienceLogic system can be delivered as a physical or virtual appliance. The ScienceLogic system can collect data without the use of monitoring agents, but in order to pull very detailed data from servers, it leverages the manufacturer's own installed agents in some cases (Dell OpenManage, HP Insight Manager, IBM Director) or WMI agents in the case of Windows server monitoring. The three examples below show what configuration information the ScienceLogic system collects for Dell, HP, and IBM servers using the manufacturer's own installed agent.

Dell OpenManage

ScienceLogic is certified to integrate seamlessly with Dell OpenManage systems management.

Asset

- Base Board Manufacturer
- Base Board Piece Part ID
- Base Board Product
- Base Board Type
- Base Board Version
- BIOS Version
- Chassis Intrusion
- CPU Bus Speed
- CPU Family
- CPU Make
- CPU Speed
- CPU Version
- Dell Model
- Dell Service Tag
- Firmware Type
- Firmware Version
 - Global Version of System Mgmt SW
- Manufacturer Name
- Operating System Name
- Operating System Version #
- PCI Device
- PCI Faults
- PCI Manufacturer

- PCI Slot
- PCI State
- System Management Software
- System Management Software Build #
- System Management Software Updates?
- System Management Software Version
- Total Physical Memory

Storage Group

Global Storage Status

Thermal Group

- Cooling Device Location
- Cooling Device Reading
- Cooling Device Status
- Temperature Probe Location Name
- Temperature Probe Reading
- Temperature Probe Status Virtual Disk

Virtual Disk Name

- Virtual Disk Roll-Up Status Array Disk Table
- Disk #

Array Disk Name

- Array Disk Roll-Up Status
- Disk Serial #
- Disk Spare State
- Disk Firmware Revision



ScienceLogic Asset and (Hardware) Configuration Management (cont.)

System State Group

- Chassis Status
- Global System Status
- Memory Device Status Combined
- Battery Status Combined
- Cooling Device Status Combined
- Event Log Status
- Intrusion Status Combined
- Power Supply Status Combined
- Processor Device Status Combined
- Temperature Status Combined
- Voltage Status Combined

Global System Status Chassis Intrusion Controller Table

- PCI Slot #
- Controller Name
- Controller Roll-Up Status
- Type
- Driver
- Firmware
- Physical Device(s)

- Logical Device(s)
- Firmware Minimum
- Dell OM: Device Group
- Memory Location Name
- Memory Manufacturer
- Memory Size
- Memory Status

Power Group

- Power Supply Status
- Power Supply Location Name
- Battery Location Name
- Battery Reading
- Battery Status
- Discrete Reading
- Output Watts
- State Settings Unique
- Voltage Probe Location Name
- Voltage Probe Reading
- Voltage Probe Status

IBM Director

Chassis

- Current State
- Health Description
- Health Resolution
- Health Status
- Name
- Model
- Model Number
- Model Type
- BIOS Version
- OS Build Number
- OS Build Type
- OS Manufacturer
- OS System Name
- OS Version
- Fan Name
- Fan Status
- Fan Tachometer Name
- Fan Tachometer Reading
- Memory Active
- Memory Error
- Memory Name
- Memory Status

- System Health Name
- System Health Status

Power

- Voltage Sensor Name
- Voltage Sensor Reading
- Voltage Name
- Voltage Status

Asset

- Asset Number
- Asset Tag
- Component Serial
- FM\
- Host ID / SID
- Identify Data
- Last Inventoried
- Lease Buyout
- Lease End Date
- Lease Name
- Lease Payment
- Lease Start Date
- Lease Term



ScienceLogic Asset and (Hardware) Configuration Management (cont.)

- Lessor
- LRF
- Manufacturer
- Memory Physical
- Owner Name
- Owner Phone
- Purchase Date
- Serial Number System Location
- System UUID
- Version

Environmental

- Temperature Reading
- Temperature Sensor Name

Status

- BIOS Status
- CDROM Drive Status
- Codec Status
- Device Memory Address Status
- Disk Drives Status

HP Insight Manager

Chassis

- Overall Condition
- HP Model Name
- System Form Factor
- Serial Number
- Operating System
- CPU Model
- CPU Socket Number
- CPU Speed
- PCI Board Name
- PCI Slot
- PCI Slot Speed
- PCI Slot Width
- Percent Used
- ROM Version
- Total Physical Memory
- Front Side Bus Speed

Storage

- File System Space Used (MB)
- File System Total Space (MB)
- Overall Array Status
- Disk Controller Status

- DMA Channel Status
- Environment Status
- IRQ Resource Status
- Load Order Group Status Network Client Status
- Network Protocol Status
- Operating System Status
- Page File Status
- Pointing Device Status
- Port Resource Status
- Registry Status
- Share Status
- System Account Status

Warranty

- Warranty Cost
- Warranty Duration
- Warranty Duration Unit
- Warranty End Date
- Warranty Name
- Logical Drive Condition
- Logical Drive Name
- Logical Drive Status
- Overall Array Status
- Physical Drive Bay Location
- Physical Drive Condition
- Physical Drive Model
- Physical Drive Serial #
- Physical Drive Status
- RAID Level

Environmental

- Fan Type
- Fan Location
- Fan Condition
- Temperature
- Temperature Location
- Temperature Condition

Power

- Power Supply Location
- Power Supply Condition
- Power Supply Status



Integrated ScienceLogic Virtualization Monitoring

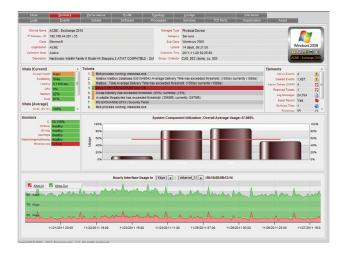
ScienceLogic delivers a consolidated, integrated solution for visibility, eventing, and reporting against all the critical components of virtualization infrastructure — from the hypervisor and guest OS to applications, hardware, clustering, network, security, and storage infrastructure. Similar to physical server monitoring, ScienceLogic's Dynamic Discovery automatically and instantly identifies and maps the virtualization infrastructure. ScienceLogic intelligently utilizes relationships between virtualization and other infrastructure components, such as network and storage, for automated event correlation and suppression. ScienceLogic's all-in-one system monitors the performance and availability of virtual servers, and supports a dynamic, highly available environment as virtual servers move among physical hosts, all while collecting metrics for both allocated and consumed resources at the hypervisor and virtual server levels. Having one console for physical and virtual servers (plus network, application, and more) translates to a complete picture of IT service delivery with integrated reporting for more efficient virtual operations and informed capacity management.

Sample reports — VM Health, VM Compliance, and VM Server Candidates. ScienceLogic provides PowerApps and management templates for VMware, Microsoft Hyper-V, Citrix Xen, and other virtualization technologies.

VMware Monitoring

- Virtual Machine Status
 - Virtual Machine Name
 - Virtual Machine Active State
 - Virtual Machine Allocated Memory
 - Virtual Machine Guest OS
 - Virtual Machine ID
 - Virtual Machine Path For Configuration File
 - Number of CPUs
 - Available Memory
 - Console Memory
 - ESX Server
 - Physical Memory
 - Product Name
 - Product Version
- Virtual Machine CPU Activity
 - Virtual Machine Display Name
 - CPU Shares
 - CPU Time
- Virtual Machine Disk Activity
 - Kilobytes Read
 - Kilobytes Written
 - Name
 - Number of reads
 - Number of writes
 - Share of Bandwidth
- Virtual Machine Memory Usage
 - Virtual Machine Display Name

- Share of Memory
- Utilized Memory
- Virtual Machine Network Activity
 - Virtual Machine Network Name
 - Kilobytes Received
 - Kilobytes Transmitted
 - Packets Received
 - Packets Transmitted



Virtual Server — Device Summary View

Device status and health at-a-glance, plus related events and tickets in a



ScienceLogic— All-in-One Solution for Fault & Performance Management, Asset Management, and IT Ticketing

From the start, ScienceLogic's all-in-one solutions have been unique, designed to be different from every other IT management solution out there. There are no modules to buy — customers get everything in a single solution, with a single pane of glass running on a single source of truth. ScienceLogic was built to support how IT operations actually work by providing the individual tools and views needed by each user (e.g., system administrator, network engineer, etc.), across all the components that make up IT service or application delivery (e.g., servers, networks, applications, virtual servers) with unified fault management plus availability and performance management plus asset management plus IT ticketing — in short, the full spectrum of IT operations. The benefits of this approach are tremendous.

Standardizing and integrating the monitoring of all the IT infrastructure components that make up IT service or application delivery into a single, unified, intelligent tool offers a level of proactive monitoring that point solutions or disparate framework modules cannot provide. Troubleshooting can start immediately, instantly, which lowers MTTR; managers get reporting and views for business-critical applications and services; and the server-to-administrator ratio increases dramatically.

Traditionally, about 70% of the IT budget and resources is spent just to keep current systems up and running, with the remainder deployed against the projects that advance the business. ScienceLogic helps IT invert that ratio and gives IT more time to spend on projects that matter by taking over and automating previously manual and time-intensive tasks and delivering tools that promote efficiency and productivity.

Integrated ScienceLogic Application Monitoring

The ScienceLogic all-in-one solution visually shows you the full picture of what's running on your physical and virtual servers — from OS to applications to databases. Understanding the relationship between these components and unifying the view into performance and availability of all components gives you the information you need to make sure business-critical applications are up and running, 24x7. The ScienceLogic solution includes additional application-availability monitors for email roundtrip, web content verification, and transaction monitoring.



Integrated ScienceLogic IT Ticketing

Creating a ticket is just one click from a system event, with the ScienceLogic platform automatically populating information already gathered with the event about the affected system. Because ScienceLogic centralizes fault and performance monitoring data, users can drill down into the affected system from the same console as the event and the ticket for immediate troubleshooting capabilities. When the associated ticket is resolved, events are automatically cleared.

Run book automation (RBA) features allow users to create new tickets automatically based on specific events and devices, or update tickets automatically with RBA actions performed. ScienceLogic's IT Ticketing also includes a customizable Knowledgebase which acts as a centralized repository for operations procedures, manuals, best practices, etc. — accessible by all of the organization's authorized ScienceLogic users.



Ticketing Console





Monitoring and management of everything in a single solution — for your IT operations today ... and tomorrow

Application

Use availability and performance, in real-time and trended, on application delivery components to keep business- critical apps up and running

System

Benefit from high-level and detailed reporting of key performance indicators and system metrics for all operating systems, plus device summary views for at-a-glance insight into system performance, availability, tickets, and events

Network

Use detailed analysis and reporting to increase availability and improve performance of converging network infrastructure, including VoIP, with support for dual-stack IPv4/IPv6 networks

Cloud

Use key features, such as chargeback, multi-tenant views, web services monitoring, automation, and integration with self-service portals to monitor public, private, and hybrid clouds

Server

Ensure uptime and performance, with automated and intelligent monitoring of physical and virtual servers and operating systems, including CPU, memory, file systems, swap, processes, software inventory, system latency and availability, hardware components, and more

Multi-tenancy

Control costs and access by assigning resources according to need, and then holding those who use them fiscally responsible through individualized billing, creating access delimiters by department and individual entity

Video and Telepresence

Avoid service issues and police call quality by using video conferencing and telepresence management on a single platform

Asset

Manage asset lifecycles with auto-populated asset and software inventory while supporting IT troubleshooting with automated hardware and config change detection to reduce IT resolution time and improve end user satisfaction

Service Desk

Use automated ticketing workflow and tools to document and accelerate the problem resolution process and to build business-specific change management processes right into operations

Fault & Event

Proactively manage your environment with customizable alert notification, escalation, and automated remediation, plugging key event details into third-party tools using our open-development platform

Virtualization

Get the complete dynamic IT operations picture with performance and availability metrics for both virtual and physical infrastructures — all in a single tool

Billing

Automated chargeback/showback and designated billing eliminate the need to measure shared resources and enable accurate accounting for individual customers and departments for bandwidth usage and shared resources, all viewable on customized self-service portals