CA Nimsoft APIs

keys to effective service management

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Introduction

The highly automated, elastic, and scalable nature of cloud and virtualized environments have fundamentally changed monitoring requirements for enterprises and service providers. One fundamental change is that monitoring can no longer be operated independently. Integration of monitoring with all of the elements of cloud and virtualization administration, deployment, and management is a hard requirement. A second mandate is for high levels of automation within monitoring solutions.

In these environments, infrastructure is now both increasingly complex and dense. Infrastructure can include hundreds to thousands of physical servers, scalable storage offerings, virtual and physical networks, tens of thousands of virtual machines, mission-critical applications, Web properties, and more. In addition to the sheer scale of these environments, cloud and virtualization add new layers of complexity. These environments can include self-service and cloud management portals, environment-specific service automation tools, and automated scaling capabilities, as well as requirements for integration with traditional IT infrastructure tool sets. This combination of scale, density, and additional complexity results in the need for monitoring solutions that...

- Eliminate the overhead, resource burden, and expense of manual monitoring deployment and multiple monitoring solutions.

Operational APIs and automation

Data collection
- Custom data collectors created using SDKs—featuring support for Perl, C/C++, VB/VB script, Java, .NET, Lua, Web services
- SNMP, SQL (from external database), and command line scripts

Data extraction and export
- Automated notifications to email, SMS, and service desk applications
- Web services integration
- Use SDKs to extract data directly from the message bus
- Event and performance management database access

Custom workflow and automation
- Event and threshold-based workflow and automation

Display and reporting
- Template-based reports and views
- Use Web content portlets to view monitoring displays in remote dashboards
- Display third-party Tomcat Web applications in CA Nimsoft portals

APIs for configuration and deployment of monitoring
- Template-based, agentless configuration and deployment
- Zero-touch, agent-based configuration and deployment

- Prevent, identify, and allow correction of outages by correlating physical and virtual resource metrics directly linked to cloud and virtualization infrastructures.

- Enable IT services and mission critical applications traditionally run from dedicated physical servers to meet and exceed required service levels in these new environments.

- Allow organizations to quickly and cost effectively create new cloud-based service offerings that drive incremental revenue and enterprise business satisfaction.

CA Nimsoft Monitor provides the application programming interfaces (APIs), automation, and extensibility required to meet these needs. CA Nimsoft Monitor offers these capabilities:

- Allows flexible, efficient, and complete integration from any layer of CA Nimsoft Monitor, to any element of virtualized and cloud environments.

- Enables the creation of custom data collectors and for extracting and exporting data from any layer of the monitoring solution stack.

- Facilitates integration of monitoring with workflow, service desk, and other infrastructure solutions.

CA Nimsoft operational APIs

CA Nimsoft offers APIs and automation capabilities that address every layer within the CA Nimsoft Unified Monitoring architecture: presentation, application, message bus, and data collection. This comprehensive set of integration and automation points provides the capabilities needed to integrate with any layer of cloud or IT infrastructure management.

Data collection APIs and integration points

With constantly changing technology sets, custom applications, highly variable hardware environments, and the mandate to differentiate offerings from competitors, businesses need monitoring solutions that enable the creation and integration of new data collection tools into their environments. CA Nimsoft provides a comprehensive set of software development kits (SDKs) that enable users to create custom data collectors, also known as probes. In addition, CA Nimsoft offers customizable data

Nimsoft Operational APIs
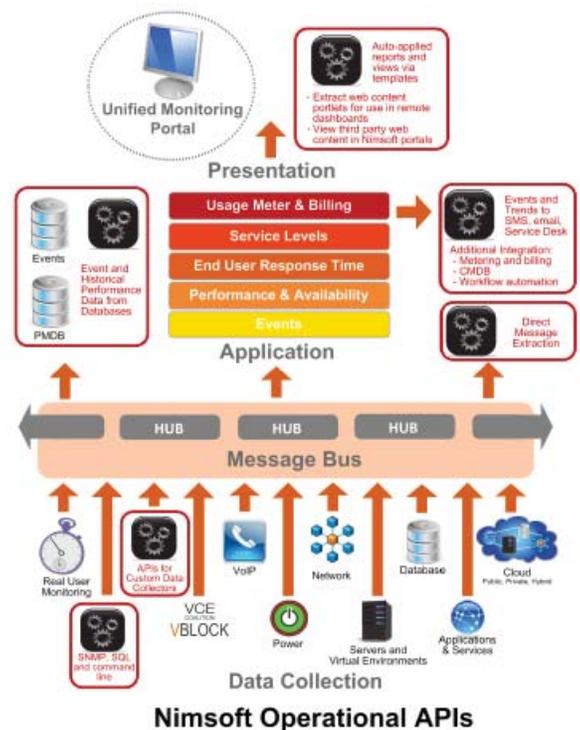
collectors that allow customers to integrate directly with SNMP, command line, and SQL-based data sources. CA Nimsoft offers the following SDKs:

- Perl

- C/C++

- VB/VB script and .NET

- Lua

- Java

- Web services

Message bus and data layer integration

Direct message extraction

In environments that feature highly integrated cloud and virtualization management stacks, direct access to message data enables additional uses of monitoring data beyond the monitoring solution. The heart of CA Nimsoft Monitor is the message bus. Built on a lightweight, scalable publish-and-subscribe architecture, the message bus features the capability to directly extract data as required. Two types of usage are most common:

- **Base monitoring integration**. To provide base management of cloud environments, monitoring data exposed by direct message extraction can be used by service desks, configuration and compliance solutions, cloud management portals, portals for cloud customer and other basic infrastructure that supports the cloud. Connectors are created using CA Nimsoft SDKs, which are available for Web services, C/C++, VB/VB Script, .NET, Lua, and Java.

- **Extended, higher value services**. To realize higher value services, monitoring data can be consumed by such applications as self-learning performance management, intelligent root-cause analysis, and business transaction management. These applications enable SLA offerings for complex, mission-critical packaged applications, multi-tier Web applications, and similar customer workloads.

Data layer integration

CA Nimsoft Monitor uses standard database structures and protocols, offering support for SQL Server in Microsoft Windows environments and MySQL or Oracle databases in Linux and UNIX environments. Schemas are publicly documented and have a well-defined support commitment that allows customers to integrate their third-party analysis and systems management tools at the database layer.

Application layer integration

CA Nimsoft Monitor provides easy access to extensive application layer information, including events and trends for service levels, thresholds, end-user experience, real-user transaction monitoring, and usage metering and billing. With CA Nimsoft Monitor, event and threshold data can be shared through direct integration with SMS, email, service desk, and, via XML, with configuration management database (CMDB) applications. Metering and billing metrics can be integrated with financial applications and Internet billing systems. Internal workflow automation provides extensive capabilities to customize operations triggered by events and trends. Finally, additional integration provides automated access to cloud resources based upon predefined triggers.

Integration with service management applications

With its extensive set of integration points for private clouds and highly virtualized environments, CA Nimsoft Monitor enables cloud providers and enterprises to easily integrate monitoring data with other service management applications. For instance, users can close out an event in a service desk application and have that "close" reflected within CA Nimsoft Monitor. In addition, CA Nimsoft SDKs (Perl, C/C+, VB/VBScript, Java, Web Services, and Lua) provide the capability to support additional workflow tools as needed. For cloud service providers, this capability can also be used to create differentiation by exposing monitoring data to customers that is not available from industry leaders—data from the virtual and physical layers of cloud environments—directly to customers via their cloud API.

Internal automation with LUA scripting

CA Nimsoft includes an extremely powerful and lightweight rules process language (LUA) that is embedded within the CA Nimsoft Alarm Server. The LUA rule processing language implementation has access to all functions of the standard CA Nimsoft API. Through this extension, the language has access to all the service catalog and object state information that exists within CA Nimsoft Monitor at any specific time, both current and historical. This language function allows CA Nimsoft Monitor to provide in-line processing of events correlated before they become recognized as operational alarms. A user can create rules to suppress events that are determined to be completely dependent effects of events happening elsewhere—for instance, suppressing downstream alarms from network switches and hubs downstream of a failed network device. In addition, triggers defined in the alarm server can be correlated using LUA.

Examples:

- LUA can be used, for example, to calculate a dynamic threshold that adjusts based on multiple inputs, rather than a single fixed percentage or number.

- In an environment with five Web servers supporting 105 Web sites—LUA can be used to suppress alarms from Web site failure when the host server is down, preventing an "alarm storm" that can visually overwhelm support when trying to find and fix the problem.

Cloud service provider workflow integration

With its capabilities for providing direct access to external cloud service provider's APIs, CA Nimsoft Monitor offers a range of opportunities for automating workflows. For example, many enterprise customers are using CA Nimsoft Monitor to automatically trigger "cloud bursting", triggering access to additional cloud-based resources based on predefined constraints. When a resource trigger is reached, integration with an external cloud provider's API enables automated addition of resources from the cloud to the customer application. For example, an organization can provide additional cloud-based servers to a media streaming application when data center resources are constrained.

Presentation layer integration and automation

CA Nimsoft provides a set of integration capabilities at the presentation layer:

- The automated application of displays and reports based on predefined templates.

- The capability to extract Web content portlets from CA Nimsoft portals for use in compliant third-party displays and tools.
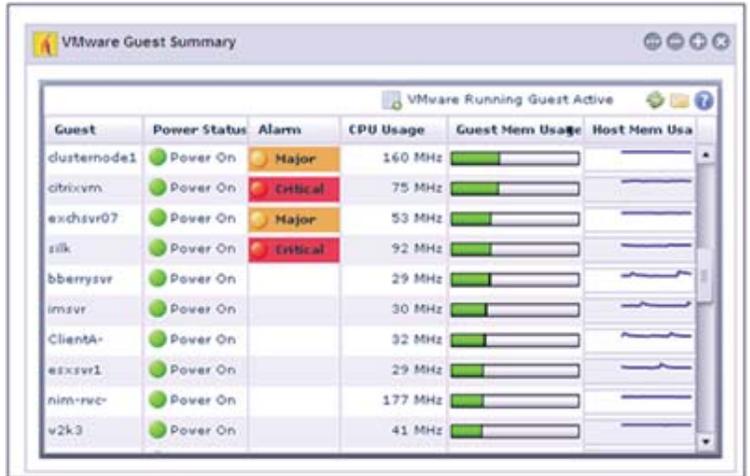
- The option to import external Tomcat Web applications for use in CA Nimsoft portals.

These capabilities make it possible to view monitoring data in cloud-based dashboards, reports, internal management portals, and customer status views—without having to manually apply monitoring display settings or integrate data with other cloud or IT management systems.

Automated application of monitoring displays and reporting

CA Nimsoft Monitor enables users to configure templates that automate the display and correlation of monitoring information. Users can configure templates based on correlating virtual machine (VM) guest resources with VM hosts, grouping by IP address or server name (including support for wild cards), and other parameters. Combined with the extensive customization and display capabilities offered by the CA Nimsoft Unified Monitoring Portal, CA Nimsoft Monitor enables users to automatically and intelligently display monitoring data—without labor intensive configuration and setup.

Web content portlets for remote display

With CA Nimsoft Monitor, capabilities for automatically applying monitoring can be combined with the means to extract portions of displays, or portlets, which can be used in portals that allow the use of remote Web content portlets. For example, the status of all VM guests on a specific VM host can be displayed in third-party portal. As a result, businesses can embed information that reveals service level insights, including trends, events, and performance data, directly into customer facing and cloud management portals that also show subscription status, configuration data, and other items.

Import Tomcat Web applications to CA Nimsoft portals

Customers that want to use the CA Nimsoft portal environment for display of other data from beyond CA Nimsoft Monitor can import Tomcat Web Applications into CA Nimsoft displays. For example, portals can display server security and compliance data in combination with server status.

APIs for configuration and deployment of monitoring

No solution for monitoring within cloud and highly virtualized environments can be effective without offering a way to automatically configure and deploy monitoring. With VM instances coming and going by the minute, APIs and automation are critical requirements for eliminating the overhead, errors, and complexity of manual configuration. CA Nimsoft Monitor enables administrators to automate monitoring based upon standard templates and gold master images, as well as through integration with provisioning systems and CMDBs. CA Nimsoft Monitor enables the automated deployment and configuration of monitoring in two models:

- Agentless—Agentless capabilities enable administrators to get basic monitoring information with minimal integration effort.

- Agent based—Agent-based deployments enable organizations to achieve higher levels of service within cloud and virtualized environments by supporting in-depth monitoring of critical services and applications—such as email, multi-tier Web applications, databases, and packaged applications like SAP and Oracle Financials.

Automatic, agentless deployment

With CA Nimsoft Monitor, administrators can use templates to set up automated, agentless monitoring of VM hosts and VM guests. CA Nimsoft Monitor can be integrated with VM management applications to discover new hosts and virtual environment guests, and then automatically deploy monitoring through predefined templates. Templates can be assigned by VM host name, server name, IP address, and other parameters. CA Nimsoft Monitor also can gracefully retire monitoring when VMs and hosts are intentionally terminated or removed from the environment.
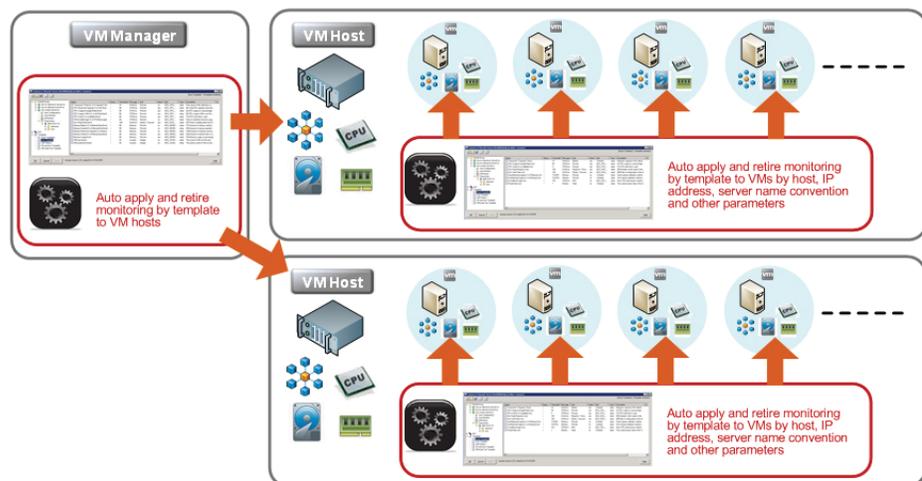
Agent-based monitoring deployment

Through its capabilities for integration with gold master images, provisioning systems, and CMDBs, CA Nimsoft Monitor enables users to configure the automated deployment of agent-based data collectors. With CA Nimsoft Monitor, the process is simple:
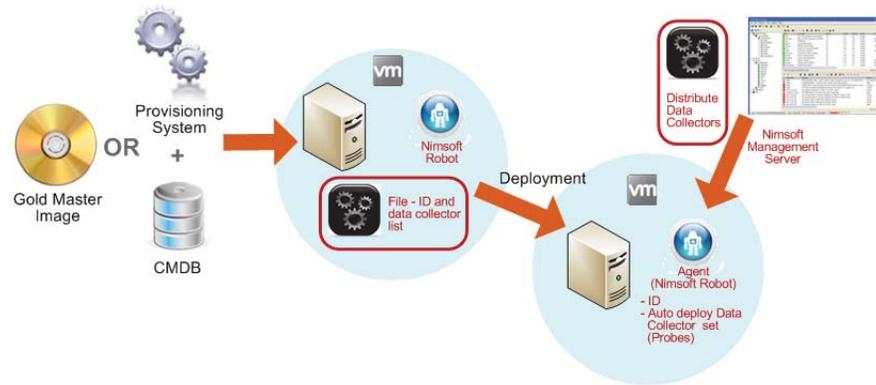
- 1. Users start by doing one of the following:

  – Creating a system image in the provisioning system that includes a CA Nimsoft agent. A text-based configuration file is then written that includes customer and system ID information and a list of data collectors that should be installed and applied as part of the provisioning process.

  – Setting up a gold master VM image that contains the same items as noted in (A).

- 2. Once the VM guest or physical server begins operation, the configuration file is read, and monitoring agents are delivered based upon the configuration file's parameters.

- 3. Data identified with the customer or system instance specified in the configuration file is used to identify the instance, and to begin monitoring and reporting appropriately.

Customer profiles

SoftLayer

SoftLayer, an infrastructure as a service (IaaS) provider, uses CA Nimsoft Monitor to monitor their cloud environment and to bring customers extended monitoring services that support such complex applications as Active Directory, DHCP services, Web servers, Web application servers, databases, email, and more. SoftLayer uses the following capabilities in CA Nimsoft Monitor:

- Agentless and agent-based configuration and deployment.

- Database and direct message extraction for integration with cloud management and service management tools.

- SDKs for custom data collection and extraction tools.

Hosting provider

In a second profile, a large hosting provider uses this same feature set to monitor both their hosting and cloud infrastructure services offerings. CA Nimsoft Monitor is the primary monitoring vehicle used for basic monitoring of the infrastructure and is integrated with internal CMDB and provisioning systems to populate agents (both custom and CA Nimsoft standard) to system images for Web site health and quality of service as well as other services.

Summary

CA Nimsoft Monitor offers the critical capabilities organizations need to maximize the performance and availability of cloud and heavily virtualized environments. With its APIs and automation capabilities, CA Nimsoft Monitor provides IT administrators with the power they need to quickly identify and correct problems when they occur and to support stringent SLAs. CA Nimsoft Monitor offers the completely integrated views needed to manage enterprise-class, mission-critical applications within public and private cloud environments:

- Comprehensive visibility into infrastructure, services, customer views, and customer service levels.

- Full transparency through any application stack.

- High levels of security, availability, and scalability.

- The capability to offer tiered monitoring levels to meet targeted business objectives and needs.

- A lightweight, scalable architecture and "zero-touch" deployment capabilities that make it ideally suited to cloud environments.

For more information, visit ca.com/nimsoft.

CA Technologies (NASDAQ: CA) provides IT management solutions that help customers manage and secure complex IT environments to support agile business services. Organizations leverage CA Technologies software and SaaS solutions to accelerate innovation, transform infrastructure and secure data and identities, from the data center to the cloud. Learn more about CA Technologies at www.ca.com.