



Whitepaper
On
Agent versus Agent less management

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Introduction

Emergence of sophisticated communication technologies, secure methodologies and industry standard adoption has enabled the possibility of managing the desktops, servers, systems, network devices and applications from the centralized server without the need to install proprietary agents on the target device which is being managed. Central server shall be responsible for collecting the data from each of the device under management and this is referred as Agentless management.

Historically, management products used custom application referred as management agents which runs on the target device under management and performs the data collection and manageability tasks as per the instruction from the central server. The concept of having separate proprietary application for this purpose is referred as agent based management.

This document discusses about the pros and cons involved agent and Agentless architecture for management. The purpose of this document is to give an audience a real picture of what is involved in management, how each of the architecture works and the merits of the same.

What is Agent based management?

- Using proprietary application for collecting the data and managing the target devices is called agent based architecture.
- Management products typically provide an agent for each flavor of the operating system and the agents are deployed on the target device either manually or automatically based on the product maturity.
- Agents have to be running on the target system to be manageable. If the agents are not running, management product shall not have any control over that device.
- Intelligence of Agent application and feature depth of the agents depends purely on the vendor or product as there is no standards for the custom agents. Some agents are bulky and hog system(cpu & memory) resources and some agents act as simple broker to enable the communication.

What is Agentless management?

The term 'Agent' is being used to refer proprietary agent and Agentless refers to the products which does not require proprietary agents for managing the target systems/devices.

- Agentless management products typically make use of the native management interfaces or technologies available with the operating system or devices and then achieve the needed management objective.



For example, Microsoft windows operating systems provide Windows management interface(WMI) based manageability support for managing operating systems, applications, etc.

For managing Unix based operating systems, the most preferred mode is Secure Shell(SSH) and the complete system can be managed using this.

Network devices and standard applications typically support Simple network management protocol (SNMP) agents to manage it effectively.

Applications expose interfaces through Java management extensions(JMX), web services or through other open standards to make it manageable.

Due to the availability of above options, it has become practical and feasible to perform management from central server without the need to deploy proprietary agents.

Agent vs Agentless Management

In this section, we compare the pros and cons of both the approaches by taking most commonly debated aspects and then analyze it based on the experience.

Sl. No	Feature under comparison	Agent based architecture	Agentless Architecture
1	Scalability	<p>Agents run on the target device under management and perform the specific management task which has been configured dynamically by the server.</p> <p>Conceptually, the agents can be used efficiently to scale-up and manage very large networks as they run on individual systems.</p> <p><i>However, it depends on the agent implementation and central server implementation as the bottlenecks are found in many products in their approach.</i></p>	<p>As the polling is performed from the central server, experts feel that there may be a restriction on the number of target devices which are manageable through this approach.</p> <p>Agentless products can scale through the adoption of multi-threaded asynchronous data collection approach and can manage very large environments.</p> <p>Certain products distribute the server load by having additional data collection server for performing remote data collection and scale-up</p>
2	Agent manageability	Agents need to be installed on target systems/devices	No proprietary agents are needed. Hence the

	overhead	<p>and it has to be monitored for uptime and agent performance as well.</p> <p>If there is a problem with an agent in a large environment, all the agents need to get upgraded. This overhead can become expensive at times and create operational havoc.</p>	<p>proprietary agent manageability overhead is zero.</p> <p>However, there is a need to make sure the native interfaces available with the operating system or devices are active and accessible.</p>
3	Agents security Threats	<p>Proprietary agents can become a security threat to an organization, If it has any vulnerability.</p> <p>Also upgrading them can prove to be a challenge.</p>	<p>No proprietary agents are involved and the risk due to this aspect is Zero.</p>
4	Customers openness for installing 3 rd party agents	<p>Network managers and server administrators in customers place are not open to install any proprietary agents in their production or mission critical system.</p> <p>This poses challenge at times to convince the customer and get a buy-in for installation</p>	<p>Customers are quite comfortable since it does not disturb their existing base-lined configuration.</p> <p>They are open to try this approach.</p>
5	Administrative privilege	<p>Central server requires administrative privilege to push the agents dynamically.</p> <p>Customers hesitate to share their critical passwords at times.</p> <p>Certain agents can be installed manually and started as part of system start-up. These agents do not require administrative privilege to perform management. However, the operation overhead is painful.</p>	<p>Central server requires administrative privilege to perform remote data collection.</p> <p>Customers hesitate to share their critical passwords at times.</p>
6	Protection against network failures	<p>Agents can gather the local monitoring information, store it and then synchronize with the central server upon completion.</p>	<p>It is not possible to manage the remote system or device when there is a network failure.</p>

		<p>Loss of data against network failures can be avoided.</p>	<p>Network connectivity is mandatory and must for an Agentless management.</p> <p>To protect against internet or broadband failures, remote data collection servers are set-up in the LAN environment to collect the data and synchronize with the central server once the network connectivity resumes.</p>
7	Complexity of Management	<p>Agent based architecture are relatively complex to deploy and manage as it involves diagnosis of various agents and central server.</p> <p>The skill level needed is relatively higher.</p>	<p>Uses native agents and information about it are public and proven.</p> <p>Hence manageability is relatively simple and skill level required is lesser.</p>
8	Support for new operating systems and devices	<p>Need to depend on product vendor to announce a support for new operating system or device and release an agent for the same.</p> <p>At times, such agents(newly released) are vulnerable with quality issues or charged separately by the product vendor for commercial gains.</p>	<p>Standard based management. Operating systems and devices are released with manageability as basic necessity.</p> <p>Hence it can be brought under management without any vendor dependency or commercial implications.</p>
9	Agent Intelligence & Network communication traffic	<p>Agents are embedded with an additional intelligence of management.</p> <p>Hence good agent implementation transmits only the necessity data after performing needed analysis and compression.</p> <p>Thus reduces the size of data transmitted over network.</p>	<p>Data collection is generic and analysis is performed at the central server.</p> <p>Hence the size of data is relatively large.</p> <p>This is applicable only for inventory data collection since Agentless management systems pull all the data and then perform change analysis in the server. Hence complete inventory is re-transmitted each-time. However, it is performed at</p>

			Performance data monitoring does not have additional overhead with this approach.
10	Controlling the systems	<p>It is possible to enforce certain policies as the agents shall be running and monitoring on the target systems all the time.</p> <p>For example, if the user needs to be blocked against launching a certain application, it can be achieved through effective agent implementation. However, agents can be turned off selectively by the users, if they have privilege.</p>	<p>It is possible to enforce certain policies by working with windows domain policies.</p> <p>Since there is no proprietary agents, enforcements against process launch, etc. cannot be achieved.</p>

Conclusion

From the technology perspective, it is possible to achieve the manageability needs through agent based as well as agent-less architecture and each approach has its pros and cons. Industry has started adapting the agent-less architecture in a big way and most of the products have come out with their Agentless offering. Some of the industry leaders are yet to launch their Agentless offering due to their strong agent based market presence and it is expected that they shall be launching their offering in near future.

It is recommended to go with the hybrid model and use the Agentless approach as a default management technique due to simplicity and the vast advantage it offers and selectively look the need for agents based on the merit of the case.