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# Analogy between Agent Less Monitoring and Agent Based Monitoring

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**Abstract**

*There has been an ongoing war among Agent-based vs. Agentless control and management technologies in the IT Service Management sector. Several vendors claim to be agentless, and do not need any special deployment of agents. Someone else include the use of proprietary agents. Both strategies have pros and cons. This study explores the agents versus agentless approach to management of enterprise processes, looking at emerging developments in both technological advances and the industry. We have compared Agent Based and Agent Less Monitoring for two different scenarios on following parameters - Installation and depth of monitoring, Cost, Maintainance, Network Overhead, Server Overhead, Knowledge, Security.In scenario 1 we conclude that Agent based collector has edge over Agent less and in scenario 2 we conclude that Agent Less collector has edge over Agent Based.*

***Keywords***- Agent Based Collectors, Agent Less Collectors, Nagios, Prometheus and Telegraf

## I. INTRODUCTION

During the first five years of the new millennium, the transition in the late 1990s' IT industry slowed to an evolutionary rate. This was not because of a lack of modern technologies and innovation but because of fiscal constraints imposed by cost-conscious management and guided by cautious shareholders. Ironically, as businesses continued to expand, IT spending flat rates allowed business IT workers to catch up in several ways. Instead of introducing new technologies at a breakneck pace, IT has focused on enhancing the current infrastructure's stability.
Agent-based systems management tools distribute server-wide control applications around the network. These agents gather data through some kind of variety of API, devicecalls, sometimes parsing log files and leveraging other personal data stores. Information from these agents will then be fed back to central tracking servers where the results will be tabulated, thresholds and alarms reviewed, and the results delivered to the end user.Control strategies for agentless environments do not distribute applications to specific servers.In the meanwhile, the central management server is surveying devices in the network, collecting usability and performance information through published API, framework.

As with its agent-based equivalent, the end-user is provided with real-time and historical data, warnings, and metrics through a system management dashboard.Enterprise Management Associates (EMA) launched a vendor-independent Internet survey to examine surveillance patterns, especially with regard to agents and agentless approaches. Such findings were followed by in-depth

interviews with two Fortune 1000 firms that use management methods in both agent-based and agentless systems. Survey findings and interviews were well linked. Agentless monitoring solutions tackle the most important issues today for businesses: cost, ease of maintenance, faster delivery and less burden on the managed server. Agent-based solutions were required to provide knowledge that their agentless counterparts did not have available.

### *A.* *AGENT* BASED COLLECTORS

Agent based monitoring has authorized the installation of an agent (small executable) on the system. To offer an example: Prometheus and Telegraf

Advantages of getting agent-based collectors:

• When an agent is mounted on a node, it can do in-depth monitoring and management.
• Data is stored on a server, and the data will be processed even though there is a network interruption.
• Because data resides on the node, data can be collected, deduced and aggregated before saving network bandwidth is transmitted.
• After collection of data a custom protection channel may also be used to transfer data over the network.

PROMETHEUS

An open-source monitoring framework with a model of dimensional data, versatile query language, effective database of regression analysis and modern alerting strategy.

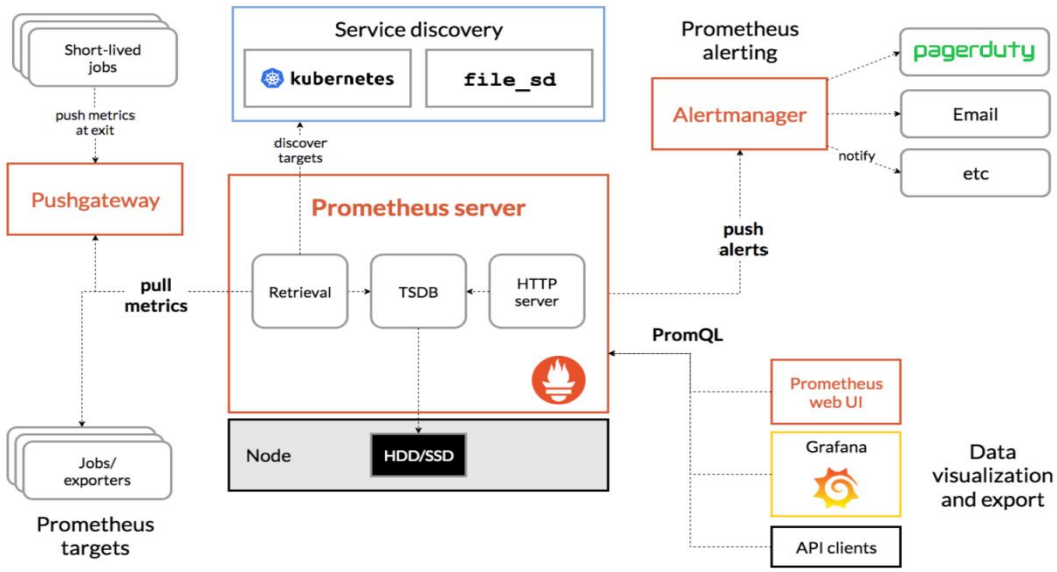


**Figure:1** Prometheus Architecture

### *B.* AGENT LESS COLLECTORS

Agentless monitoring is a type of network monitoring in which a monitor extracts performance

measurements through devices while installing a software agent on the monitored devices or servers. Agentless monitoring is common as it helps companies to escape the complexities of installing software agents on servers, as they would have to do with a monitoring ideology based on agents.

Benefits of providing agent with fewer collectors:

- Easy to deploy, agentless control. Get up in a few minutes and continue playing.
- Low maintenance, since only a few data collectors need regular monitoring
- Maximum flexibility: identify the infrastructure levels to be monitored with agents and those to be monitored in an agent-free manner
- Integrated integration of agent indicators and agent-free monitors into a single glass screen.

NAGIOS

Nagios Core, is a free and open source and computer software monitoring systems, networks and infrastructure. Nagios offers servers, switches, software and facilities with monitoring and alerting systems. This warns users when things go wrong and warns them when the situation has been fixed a second time.The Nagios Log Server significantly simplifies the search process for your log info. Set up alarms to warn you when there are possible risks, or simply check your log data to inspect any device quickly. You get all of your log data in one location with Nagios Log Server, with high availability and built fail-over right in.

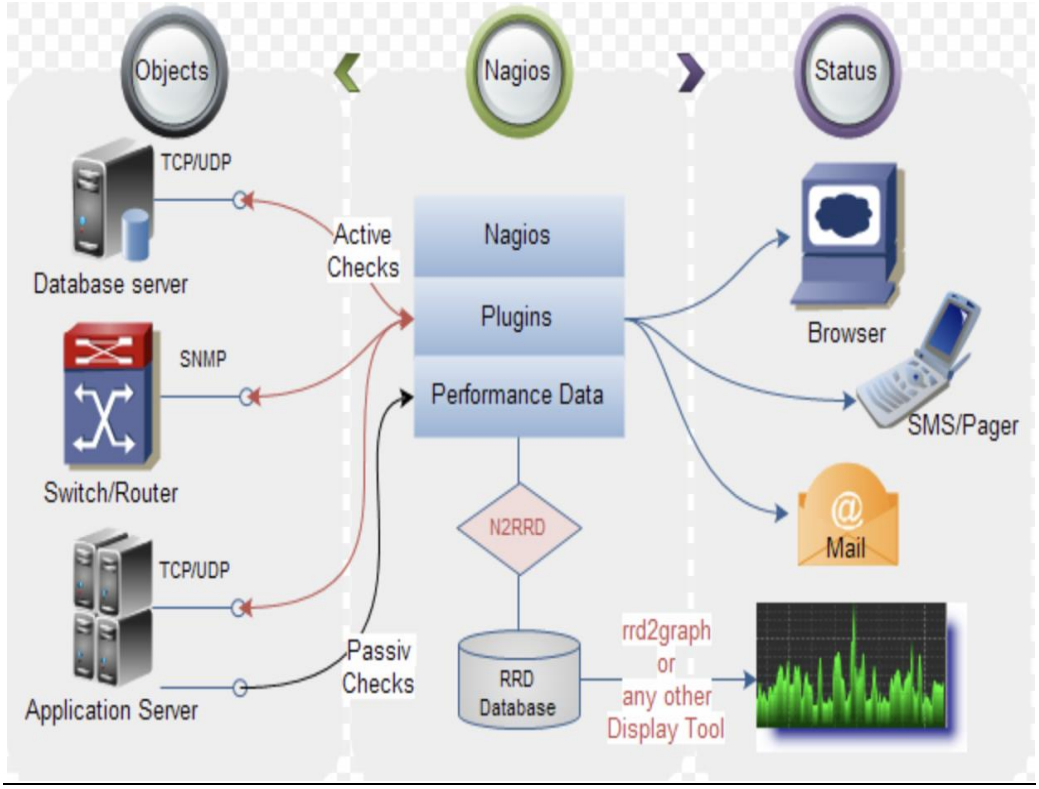


**Figure 2:** Nagios Architecture

We have compared Agent Based and Agent Less Monitoring for two different scenarios:

Scenario 1: Data Center has spread across private and public (Aws/Azure, etc.) cloud. Collect logs generated from the servers and also monitor status of all its servers.

Scenario 2: Data centers having various network devices, storage devices and embedded devices such as routers, printers, switches and firewalls. Collect logs generated from network devices, storage devices and embedded devices and also monitor status of all its servers.

## II. RESEARCH WORK

SCENARIO 1:

Data Center has spread across private and public (Aws/Azure, etc.) cloud. PerformanceMonitoring ofservers across private and public cloud.

Above that the scenario can be tracked with fewer agent as well as collectors dependent on agent. But both can have pluses and minuses of their own.

1) INSTALLATION AND DEPTH OF MONITORING:

- Agent Based monitoring involves a server-installed agent with one central system, while Agent Less just requires central system deployment.
- Some data stored in local files or databases cannot be collected because Agent Less collectors track device from outside.
- Processing data correctly on the source network is not always feasible, thereby requiring extra bandwidth.

2) COST:

- Any additional server needed by Agent Lesscollector for monitoring against Agent Based Collector and additional costs for such servers. Thus costs in Agent Less collectors are higher.

3) MAINTENANCE:

- InAgent Based Collectors software needs to be installed and managed on all tracked servers, making the management of Agent Based collectors more difficult.

- A centralized data collector collects Performance Measurements with Agentless control. The central management tool uses standard protocols to use a remote API to access the monitoring data.

4) NETWORK OVERHEAD:

- Agentless monitoring needs an external network, as raw data information is transmitted to remote data collectors.

- Agent Based Control gathers data locally, aggregates the data and sends it over the network, thereby saving a lot of overhead network.

5) SERVER OVERHEAD:

- Agent Dependent Control agents are installed on the target server and consume both a CPU cycle and low memory. There would be more overhead if the collection frequency is low.
- Agent Less has no permanent overhead on the target server but some CPU cycle will be consumed upon receipt of the polling order.

6) KNOWLEDGE:

- Agent Less collector includes comprehensive network routing expertise and some custom configuration to capture an adequate traffic analysis amongst monitored devices.

7) SECURITY:

- The OS communications agent is managed internally to the server in Agent Based Monitoring. Therefore no need to install additional firewall rules.

- The activation of multiple methods for collecting data remotely offers additional attack vectors in Agent Less Monitoring.

1ST**CONCLUSION:** We conclude that Agent based collector has edge over Agent less as:

- Agent Based collector collect more in-depth metrics,
- Since additional hardware is not required so low cost.
- Low network overhead (network transfer takes lot of time) makes more suitable.
- Highly secure as everything is behind firewall.
- Less understanding of network concepts is required.
- A little more Server Overhead but hardware is cheaper now so manageable.
- The only major drawback is maintenance as we have to maintain agents installed on all machines.

**Scenario 2:** Data centers having various network devices like routers, switches, hubs, etc., storage devices and embedded devices such as ATM machines, printers, switches and firewalls. Collect logs generated from network devices, storage devices and embedded devices and also performance monitoring all its servers.

Since Agent Based collectors have to installed on the devices to monitor it. All network, storage and embedded devices can't have agents installed on it.

List of devices and whether they can be monitored using Agent Less and Agent Based Collector-

Table 1: List of devices monitored using agent less and agent based collector

| Device | Agent Less Collector | Agent Based Collector |
|---|---|---|
| Network Device | Yes | No |
| Storage Device | Yes | Yes |
| Embedded Device | Yes | No |
| Servers | Yes | Yes |

2NDCONCLUSION: We conclude that not all the use cases can be handled by Agent Based Collector. So, either we can use:

1. Agent Less Collector – Since all the information can be fetched using Agent Less Collector, we can use Agent Less Collector.

2. A combination of Agent Based and Agent Less Collector -

    - Agent Less Collector can be used for monitoring of Network and embedded devices.
    - Agent Based Collector for monitoring Storage devices and Servers and get some benefit of collecting monitoring data in depth, Security, Network Overhead and cost.

COMPANIES USING PROMETHEUS:


COMPANIES USING NAGIOS:


From the above discussion we conclude that for Scenario one, Agent Based Collector is more preferred as it stands out for more number of parameters and for Scenario two, agent less collector is preferred as Agent Based single handily cant cater to all the scenarios.

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