

Experiment No. 10

Aim: To compute Port, Service monitoring, Windows/Linux server monitoring using Nagios.
(LO1, LO5)

Theory:

Windows Service Monitoring with Nagios:

Capabilities:

Nagios provides complete monitoring of Microsoft Windows services. Nagios is capable of monitoring the state of any Windows service (IIS, Exchange, DHCP, etc) and alerting you when the service is stopped or crashed.

Benefits:

Implementing effective Windows service monitoring with Nagios offers the following benefits:

- Increased server, services, and application availability.
- Fast detection of network outages and protocol failures.
- Fast detection of failed services and batch jobs.

What is Continuous Monitoring in DevOps?

Continuous Monitoring (CM), sometimes called Continuous Control Monitoring (CCM), is an automated process by which DevOps personnel can observe and detect compliance issues and security threats during each phase of the DevOps pipeline. It helps teams or organizations monitor, detect, study key relevant metrics, and find ways to resolve said issues in real-time.

Continuous Monitoring basically assists IT organizations, DevOps teams in particular, with procuring real-time data from public and hybrid environments. This is especially helpful with implementing and fortifying various security measures – incident response, threat assessment, computers, and database forensics, and root cause analysis. It also helps provide general feedback on the overall health of the IT setup, including offsite networks and deployed software.

Goals of Continuous Monitoring in DevOps:

- Enhance transparency and visibility of IT and network operations, especially those that can trigger a security breach, and resolve it with a well-timed alert system.
- Help monitor software operation, especially performance issues, identify the cause of the error, and apply appropriate solutions before significant damage to uptime and revenue.
- Help track user behavior, especially right after an update to a particular site or app has been pushed to prod. This monitors if the update has a positive, negative, or neutral effect on user experience.

Types of Continuous Monitoring:

1. **Infrastructure Monitoring:** Monitors and manages the IT infrastructure required to deliver products and services. This includes data centers, networks, hardware, software, servers, storage, and the like. Infrastructure Monitoring collates and examines data from the IT ecosystem to improve product performance as far as possible.
2. **Application Monitoring:** Monitors the performance of released software based on metrics like uptime, transaction time and volume, system responses, API responses, and general stability of the back-end and front-end.
3. **Network Monitoring:** Monitors and tracks network activity, including the status and functioning of firewalls, routers, switches, servers, Virtual Machines, etc. Network Monitoring detects possible and present issues and alerts the relevant personnel. Its primary goal is to prevent network downtime and crashes.

How to Implement Continuous Monitoring:

Software vendors create robust and versatile solutions that enable IT organizations to effectively monitor network traffic, detect anomalies or suspicious patterns of activity and develop actionable insights. The implementation of a continuous monitoring software solution can be described in five basic steps:

1. **System Definition:** The IT organization must determine the scope of its continuous monitoring deployment. Which systems are under the purview of the IT organization? Which systems should be subject to continuous monitoring?
2. **Risk Assessment:** The IT organization should conduct a risk assessment of each asset it wishes to secure, categorizing assets based on the risk and potential impact of a data breach. Higher-risk assets will require more rigorous security controls, while low-risk assets may require none at all and could even serve as a "honeypot."
3. **Choosing and Implementing Security Control Applications:** Once a risk assessment has been completed, the IT organization should determine what types of security controls will be applied to each IT asset. Security controls can include things like passwords and other forms of authentication, firewalls, antivirus software, intrusion detection systems (IDS) etc.
4. **Software Tool Configuration:** As the IT organization coordinates the desired security controls to protect key informational assets, it can begin to configure a continuous monitoring software tool to start capturing data from those security control applications. Continuous monitoring software tools incorporate a feature called log aggregation that collects log files from applications deployed on the network, including the security applications that are in place to protect information assets.
5. **Ongoing Assessment:** Collecting data from throughout the IT infrastructure is not the ultimate goal of continuous monitoring. With millions of data points generated and centralized each day through log aggregation, information must be assessed on an ongoing basis to determine whether there are any security, operational or business issues that require attention from a human analyst.

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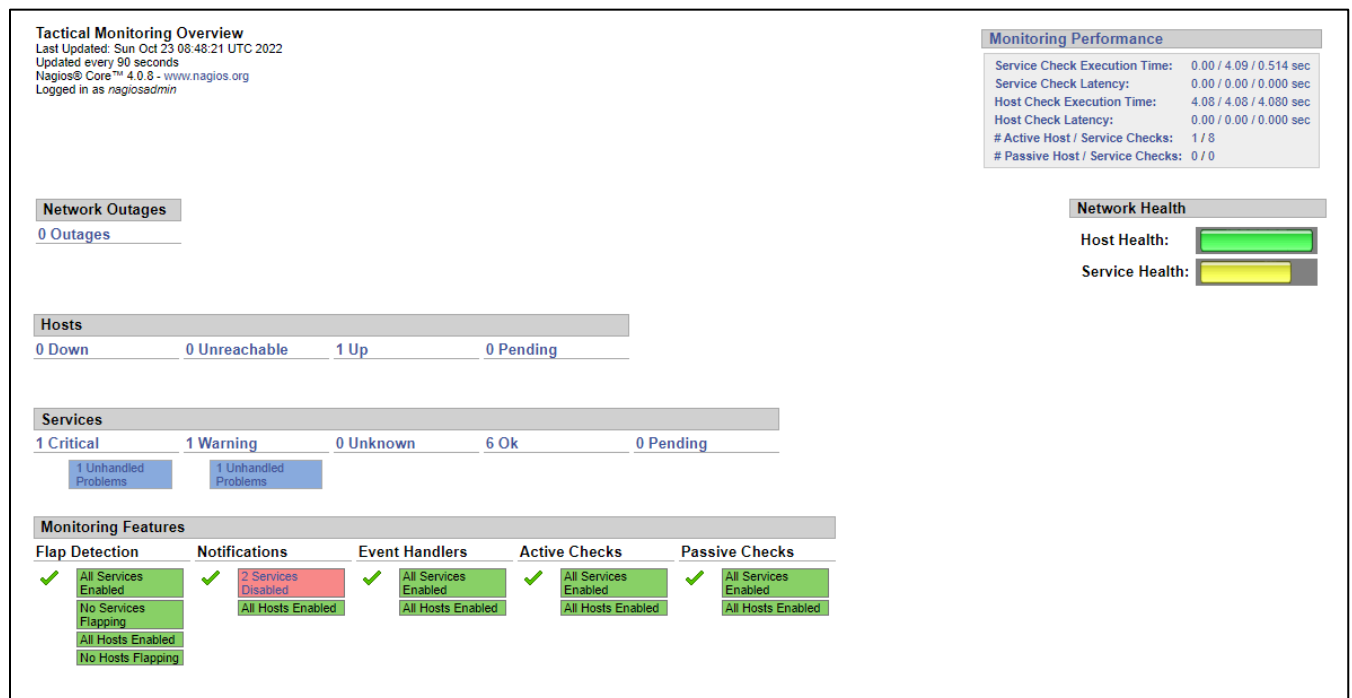
Subject: Advance DevOps , Sem: SEM V
Class / Batch: TE-IT / Batch B

Benefits of Continuous Monitoring:

1. **Better Network Visibility and Transparency:** CM offers DevOps teams clarity on the state of the IT infrastructure by automatically collecting and analyzing data to reflect possible outages and important trends.
2. **Facilitates Rapid Responses:** A primary aspect of CM is implementing an alert system that immediately notifies the right people the minute an IT incident emerges. This enables timely response to security threats or functional stop-gaps, minimizing damage and allowing faster restoration of the system to optimal operational levels.
3. **Minimizes System Downtime:** Consistent system monitoring and quick, necessary alerts help maintain system uptime by raising the alarm when there is a service outage or any application performance issues.
4. **Assists with Healthy Business Performance:** Reduction in system downtime also minimizes negative impact on customer experience, thus safeguarding the organization against losses in revenue or credibility. As mentioned before, Continuous Monitoring tools can also be used to track user reactions to software updates, which is useful for several teams – development, QA, sales, marketing, customer service, etc.

Steps to perform the Experiment:

Step 1: Tactical Overview




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Step 2: Map

Network Map For All Hosts
Last Updated: Sun Oct 23 08:49:14 UTC 2022
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin
[View Status Detail For All Hosts](#)
[View Status Overview For All Hosts](#)

Layout Method: Circular (Marked Up)
Drawing Layers: Linux Servers
Suppress popups: ☐
Scaling factor: 0.0
Layer mode: ☒ Include ☐ Exclude
[Update](#)



Step 3: Hosts

Current Network Status
Last Updated: Sun Oct 23 08:49:49 UTC 2022
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin
[View Service Status Detail For All Host Groups](#)
[View Status Overview For All Host Groups](#)
[View Status Summary For All Host Groups](#)
[View Status Grid For All Host Groups](#)

Host Status Totals
Up Down Unreachable Pending
1 0 0 0
All Problems All Types
0 1

Service Status Totals
Ok Warning Unknown Critical Pending
6 1 0 1 0
All Problems All Types
2 8

Host Status Details For All Host Groups
Limit Results: 100

Host	Status	Last Check	Duration	Status Information
localhost	UP	10-23-2022 08:47:31	0d 0h 36m 32s	PING OK - Packet loss = 0%, RTA = 0.04 ms

Results 1 - 1 of 1 Matching Hosts

Step 4: Hosts group

Summary

Current Network Status
Last Updated: Sun Oct 23 08:51:17 UTC 2022
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin
[View Service Status Detail For All Host Groups](#)
[View Host Status Detail For All Host Groups](#)
[View Status Overview For All Host Groups](#)
[View Status Grid For All Host Groups](#)

Host Status Totals
Up Down Unreachable Pending
1 0 0 0
All Problems All Types
0 1

Service Status Totals
Ok Warning Unknown Critical Pending
6 1 0 1 0
All Problems All Types
2 8

Status Summary For All Host Groups

Host Group	Host Status Summary	Service Status Summary
Linux Servers (linux-servers)	1 UP	6 OK 1 WARNING : 1 Unhandled 1 CRITICAL : 1 Unhandled

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Grid

Current Network Status
Last Updated: Sun Oct 23 08:51:32 UTC 2022
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin

[View Service Status Detail For All Host Groups](#)
[View Host Status Detail For All Host Groups](#)
[View Status Overview For All Host Groups](#)
[View Status Summary For All Host Groups](#)

Host Status Totals




Up	Down	Unreachable	Pending
1	0	0	0
All Problems		All Types	
0		1	

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
6	1	0	1	0
All Problems		All Types		
2		8		

Status Grid For All Host Groups

Linux Servers (linux-servers)

Host	Services	Actions
localhost	Current Load Current Users HTTP PING Root Partition SSH Swap Usage Total Processes	  

Step 5: Problems

Current Network Status
Last Updated: Sun Oct 23 08:51:48 UTC 2022
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin

[View History For all hosts](#)
[View Notifications For All Hosts](#)
[View Host Status Detail For All Hosts](#)

Host Status Totals

Up	Down	Unreachable	Pending
1	0	0	0
All Problems		All Types	
0		1	

Service Status Totals

Ok	Warning	Unknown	Critical	Pending
6	1	0	1	0
All Problems		All Types		
2		8		

Service Status Details For All Hosts

Display Filters:
Host Status Types: All
Host Properties: Any
Service Status Types: All Problems
Service Properties: Any

Limit Results: 100

Host	Service	Status	Last Check	Duration	Attempt	Status Information
localhost	HTTP	WARNING	10-23-2022 08:47:31	0d 0h 37m 16s	4/4	HTTP WARNING: HTTP/1.1 403 Forbidden - 3932 bytes in 0.001 second response time
	Swap Usage	CRITICAL	10-23-2022 08:50:01	0d 0h 34m 46s	4/4	SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.

Results 1 - 2 of 2 Matching Services

Step 6: History

Alert History
Last Updated: Sun Oct 23 08:52:38 UTC 2022
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as nagiosadmin

[View Status Detail For All Hosts](#)
[View Notifications For All Hosts](#)










All Hosts and Services

Latest Archive
Log File Navigation
Sun Oct 23 00:00:00 UTC 2022
to
Present..

File: /usr/local/nagios/var/nagios.log

State type options:
☒ All state types
History detail level for all hosts:
☒ All alerts
☐ Hide Flapping Alerts
☐ Hide Downtime Alerts
☐ Hide Process Messages
☐ Older Entries First

October 23, 2022 08:00

 [10-23-2022 08:20:02] SERVICE ALERT: localhost:Swap Usage:CRITICAL:HARD:4:SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.
 [10-23-2022 08:19:02] SERVICE ALERT: localhost:Swap Usage:CRITICAL:SOFT:3:SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.
 [10-23-2022 08:18:02] SERVICE ALERT: localhost:Swap Usage:CRITICAL:SOFT:2:SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.
 [10-23-2022 08:17:32] SERVICE ALERT: localhost:HTTP:WARNING:HARD:4:HTTP WARNING: HTTP/1.1 403 Forbidden - 3932 bytes in 0.001 second response time
 [10-23-2022 08:17:02] SERVICE ALERT: localhost:Swap Usage:CRITICAL:SOFT:1:SWAP CRITICAL - 0% free (0 MB out of 0 MB) - Swap is either disabled, not present, or of zero size.
 [10-23-2022 08:16:32] SERVICE ALERT: localhost:HTTP:WARNING:SOFT:3:HTTP WARNING: HTTP/1.1 403 Forbidden - 3932 bytes in 0.001 second response time
 [10-23-2022 08:15:32] SERVICE ALERT: localhost:HTTP:WARNING:SOFT:2:HTTP WARNING: HTTP/1.1 403 Forbidden - 3932 bytes in 0.001 second response time
 [10-23-2022 08:14:32] SERVICE ALERT: localhost:HTTP:WARNING:SOFT:1:HTTP WARNING: HTTP/1.1 403 Forbidden - 3932 bytes in 0.001 second response time
 [10-23-2022 08:12:40] Nagios 4.0.8 starting... (PID=26377)

Conclusion: From this experiment, we have studied and understood about the concept of server monitoring using the Nagios tool on different ports and services which are being used and served by the server. Hence, we have successfully achieved the Lab Outcome One and Five (LO1 and LO5). Also, we have achieved PO1, PO2, PO3, PO4, PO5, PO9, PO10 and PO12 from this experiment.