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Webinar

Advanced Windows monitoring

all your microphones are muted

ask your questions in Q&A, not in the Chat

use Chat for discussion, networking or applause

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Advanced Windows monitoring

Windows Server

- Out of the Box monitoring
- Agent extension
- What?
- How?

Windows Server 2016

Windows Server 2012

Windows Server 2022

Windows Server 2019

Advanced Windows monitoring

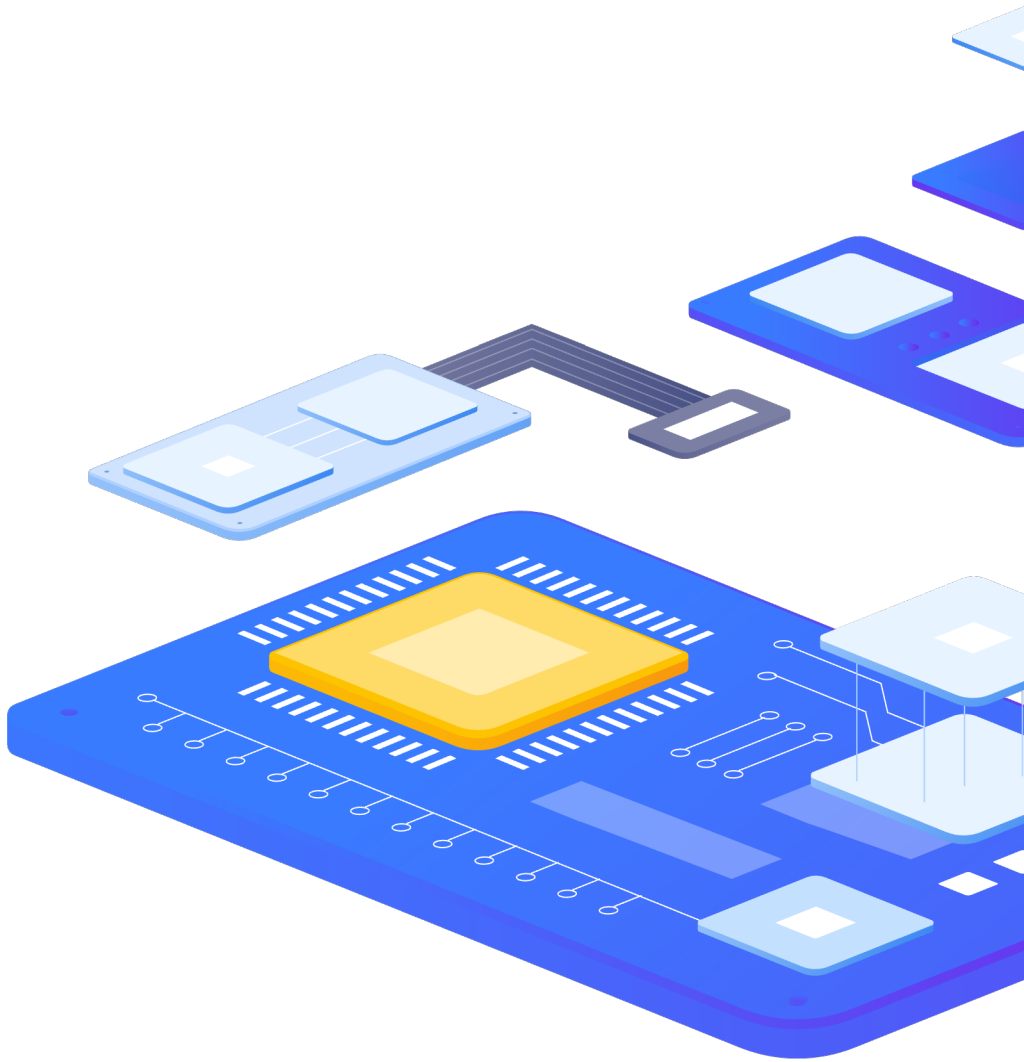
Agenda

Out of the box Windows items and templates

- Windows registry
- Performance counters
- Scripts

Windows Services and applications

- Active Directory
- DHCP
- DNS
- MSSQL
- Exchange Server
- And more …



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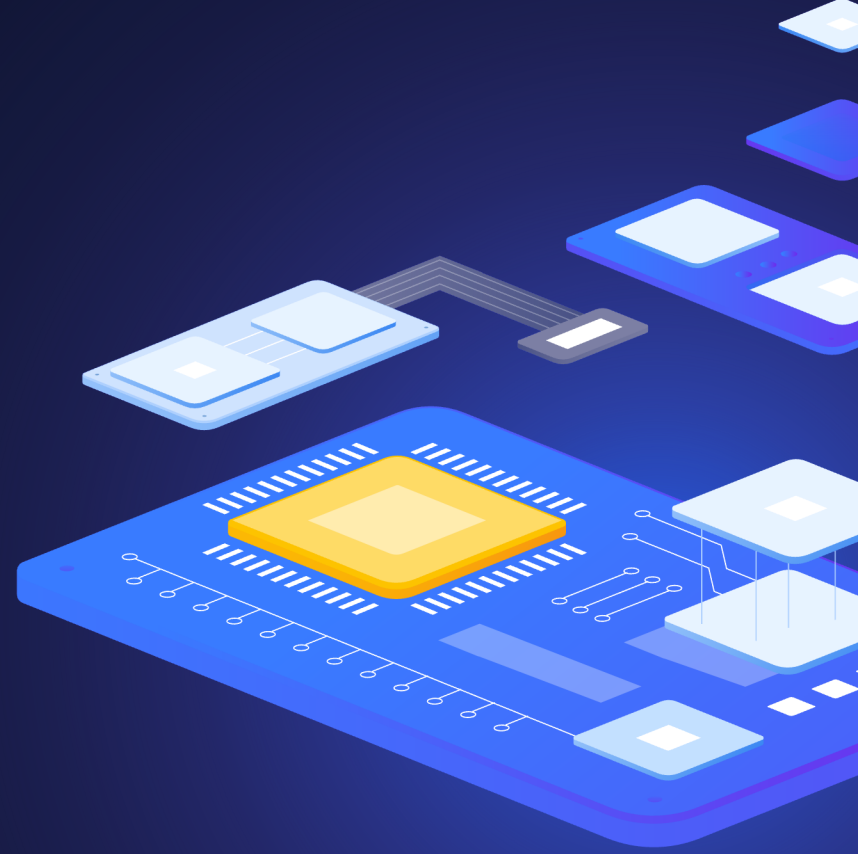
Out of the box



Advanced Windows monitoring

Windows Out-of-the-box templates

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OS Templates

- Windows by Zabbix agent
- Windows by Zabbix agent active
- Windows SNMP
- Agentless monitoring

Microsoft APP Templates

- MSSQL by ODBC
- MSSQL by Zabbix agent 2
- Exchange Server
- IIS Server
- SharePoint Server

Tested versions

- Windows 10 and newer.
- Windows Server 2016 and newer.

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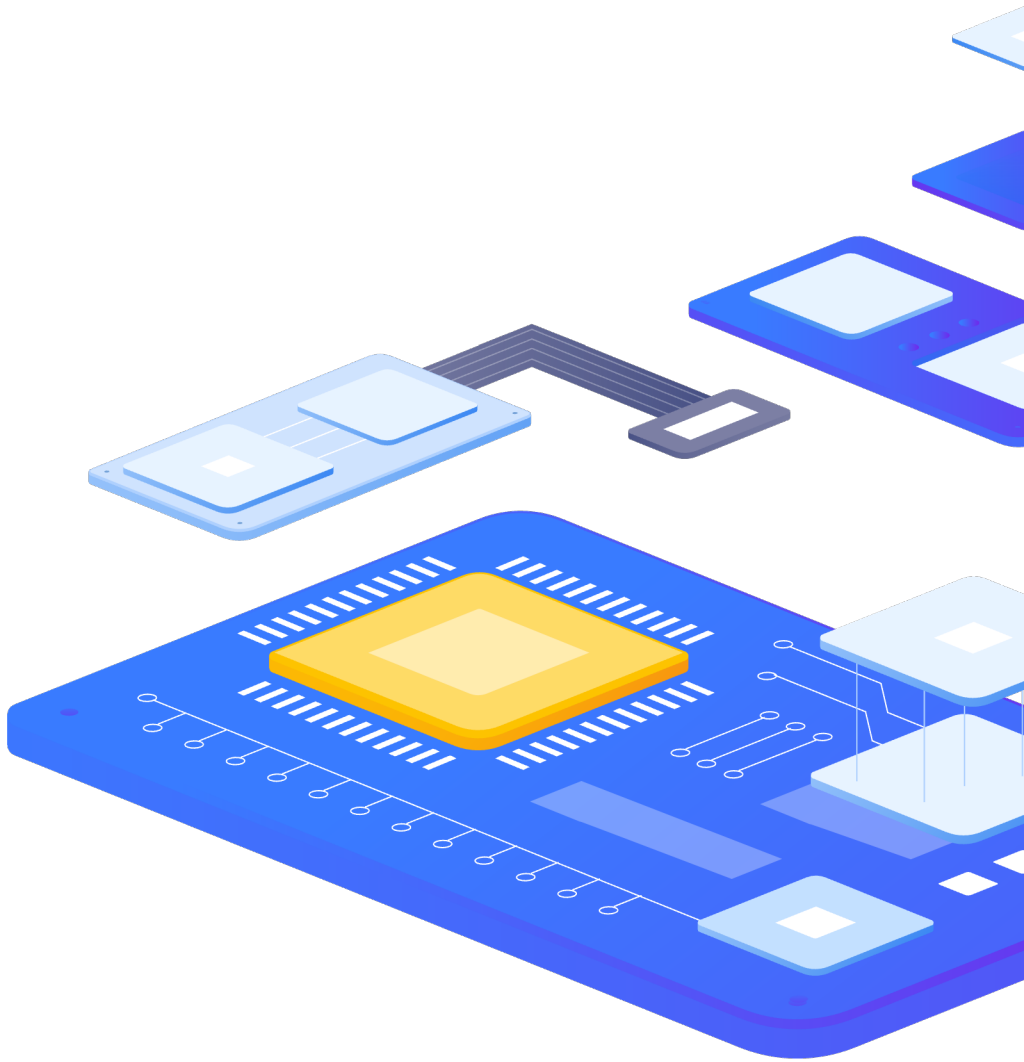
Advanced Windows monitoring

Windows by Zabbix agent

Components

- Availability
- Performance
- Security
- Inventory



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Zabbix agent(2) for Windows - installation

Manual installation

- Zip package
- Msi package

```
msiexec /l*v log.txt /i zabbix_agent2-7.0.10-windows-amd64-openssl.msi /qn
SERVER=10.1.1.165 SERVERACTIVE=10.1.1.165 TLSCONNECT=psk TLSACCEPT=psk
TLSPSKIDENTITY=winwebinar
TLSPSKVALUE=232dc96cb34b17875753b7411d882b70e9868e1ddeb229d65e11ce83555c2a11
```

Automatic installation

- Group policy
- WSUS-PP
- SCCM
- Ansible
- … and more

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Zabbix agent(2) for Windows - security

Zabbix agent service

- LocalSystem account
  - Default installation

- Local User Account
  - Minimum permission level for Windows agent items
  - https://www.zabbix.com/documentation/current/en/manual/appendix/items/win_permissions#minimum-permission-level-for-windows-agent-items
- Domain User Account

- MSA/gMSA Account
  - https://learn.microsoft.com/en-us/windows-server/identity/ad-ds/manage/group-managed-service-accounts/group-managed-service-accounts/group-managed-service-accounts-overview

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Zabbix agent(2) for Windows - security

Managed Service Account, group Managed Service Account

gMSA Account items

- Logon on as service
- Log file access rights

```
import-module ActiveDirectory

Add-KdsRootKey -EffectiveTime ((get-date).addHours(-10))

New-ADServiceAccount -Name zabbixSVC -Path "CN = Managed Service Accounts, DC=labdc, DC=lab,
DC=local" -DNSHostName labdc02.lab.local

Set-ADServiceAccount -Identity zabbixSVC -PrincipalsAllowedToRetrieveManagedPassword
labdc02.lab.local$

Test-ADServiceAccount -Identity zabbixSVC |fl
Install-ADServiceAccount -Identity zabbixSVC
Get-AdServiceAccount -Filter *
```

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Zabbix agent(2) for Windows - security

PowerShell commands explained (1/2)

- Loads the tools needed to manage Active Directory

```
import-module ActiveDirectory
```

- Creates the Key Distribution Services root key. One-time setup in a domain required to generate gMSA passwords. The -addhours(-10) part is a trick to make the key effective immediately.

```
Add-KdsRootKey -EffectiveTime ((get-date).addHours(-10))
```

- Creates the managed service account named zabbixSVC

```
New-ADServiceAccount -Name zabbixSVC -Path "CN = Managed Service Accounts, DC=labdc, DC=lab, DC=local" -
DNSHostName labdc02.lab.local
```

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Zabbix agent(2) for Windows - security

PowerShell commands explained (2/2)

- Specifies which computer is allowed to retrieve and use the password for this account

```
Set-ADServiceAccount -Identity zabbixSVC -PrincipalsAllowedToRetrieveManagedPassword labdc02.lab.local$
```

- Validates, installs, and lists the gMSA (Group Managed Service Account)

```
Test-ADServiceAccount -Identity zabbixSVC |fl
Install-ADServiceAccount -Identity zabbixSVC
Get-AdServiceAccount -Filter *
```

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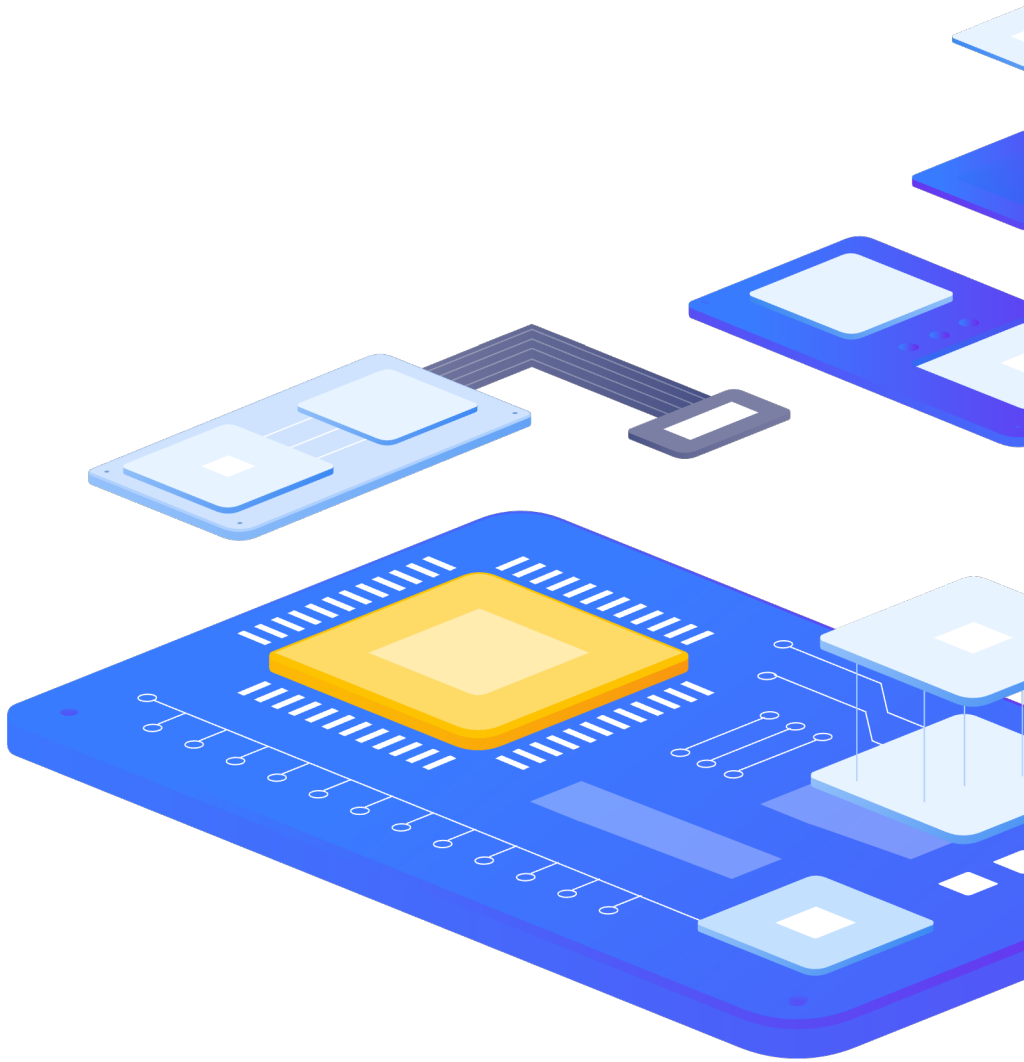
Windows by Zabbix agent

Performance

- CPU
- Memory
- Processes
- Filesystems
- Network interfaces
- Physical disks
- Windows Services

Inventory

- OS info
- Agent info



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Advanced Windows monitoring

Windows by Zabbix agent - CPU

CPU – Built in metrics:

- system.cpu.Discovery - The list of detected CPUs/CPU cores.
- system.cpu.load - The CPU load.
- system.cpu.num - The number of CPUs.
- system.cpu.util - The CPU utilization percentage.

Performance Counters:

- perf_counter_en["\Processor Information(_total)\% Processor Time"]

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Windows by Zabbix agent - CPU

Performance Counters for Zabbix Item

- perf_counter_en["\Processor Information(_total)\% Processor Time"]

- Possible to check locally through CMD

```
typeperf "\Processor Information(_total)\% Processor Time"
```

- Or through PowerShell

```
Get-Counter -Counter "\Processor Information(_total)\% Processor Time"
```

- Get all counters from Windows CMD

```
typeperf -q > C:\all_counters.txt
```

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Zabbix agent(2) for Windows - items

Windows-specific items

Eventlog	The Windows event log monitoring.	Log monitoring
net.if.list	The network interface list (includes interface type, status, IPv4 address, description).	Network
perf_counter	The value of any Windows performance counter.	Performance counters
perf_counter_en	The value of any Windows performance counter in English.	
perf_instance.Discovery	The list of object instances of Windows performance counters.	
perf_instance_en.discovery	The list of object instances of Windows performance counters, discovered using the object names in English.	
proc_info	Various information about specific process(es).	Processes
registry.data	Return data for the specified value name in the Windows Registry key.	Registry
registry.get	The list of Windows Registry values or keys located at given key.	
service.discovery	The list of Windows services.	Services
service.info	Information about a service.	
services	The listing of services.	
vm.vmemory.size	The virtual memory size in bytes or in percentage from the total.	Virtual memory
wmi.get	Execute a WMI query and return the first selected object.	WMI
wmi.getall	Execute a WMI query and return the whole response.	

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Zabbix agent(2) for Windows - items

Performance counters

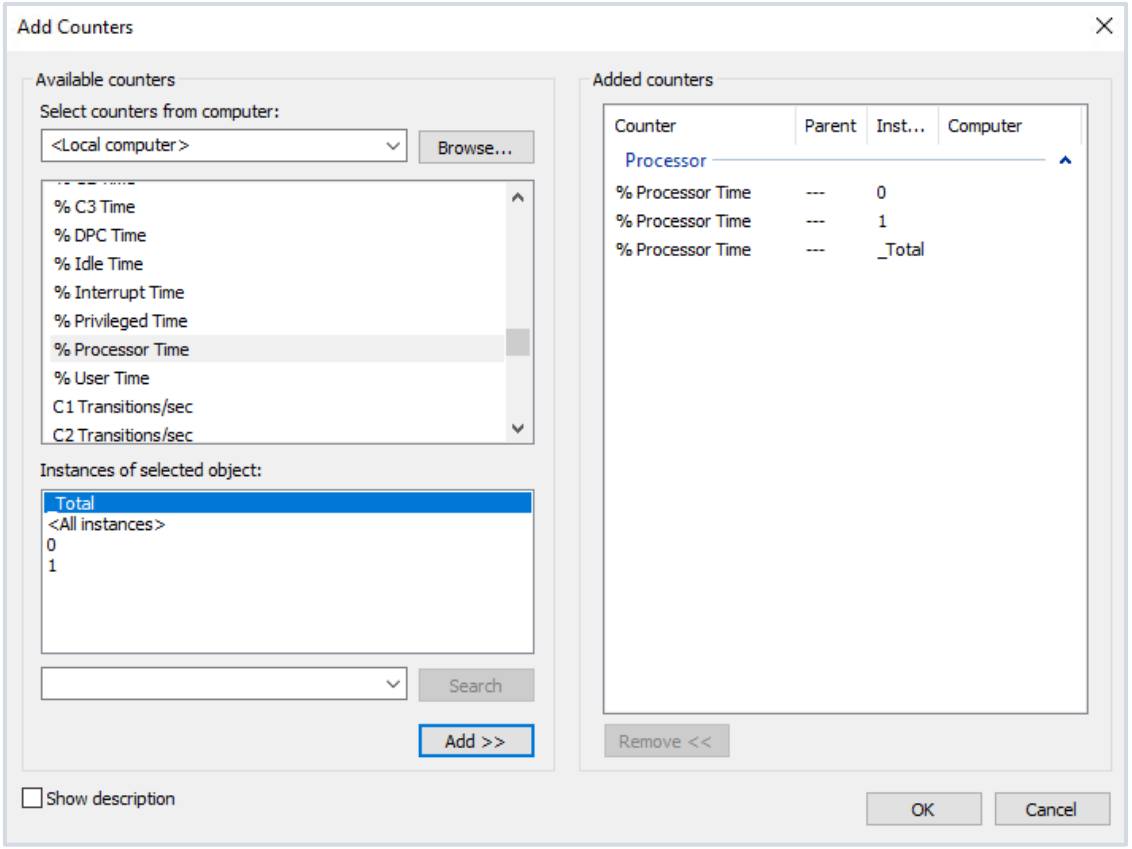
- Windows Performance Counters provide a high-level abstraction layer that provides a consistent interface for collecting various kinds of system data such as CPU, memory, and disk usage.

perf_counter

- perf_counter- The value of performance counter.
- perf_counter_en

perf_instance.Discovery

- perf_instance.Discovery - The list of object instances.
- perf_instance_en.discovery



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Windows Out-of-the-box items

Windows Management Instrumentation - WMI

- Windows Management Instrumentation (WMI) is the infrastructure for management data and operations on Windows-based operating systems.

Tools:

- SimpleWMIView
- PowerShell

Zabbix Items:

- wmi.get
- wmi.getall

```
Get-WmiObject -Namespace root/cimv2 -Query "SELECT Name,UserName,Manufacturer
FROM Win32_ComputerSystem"
```

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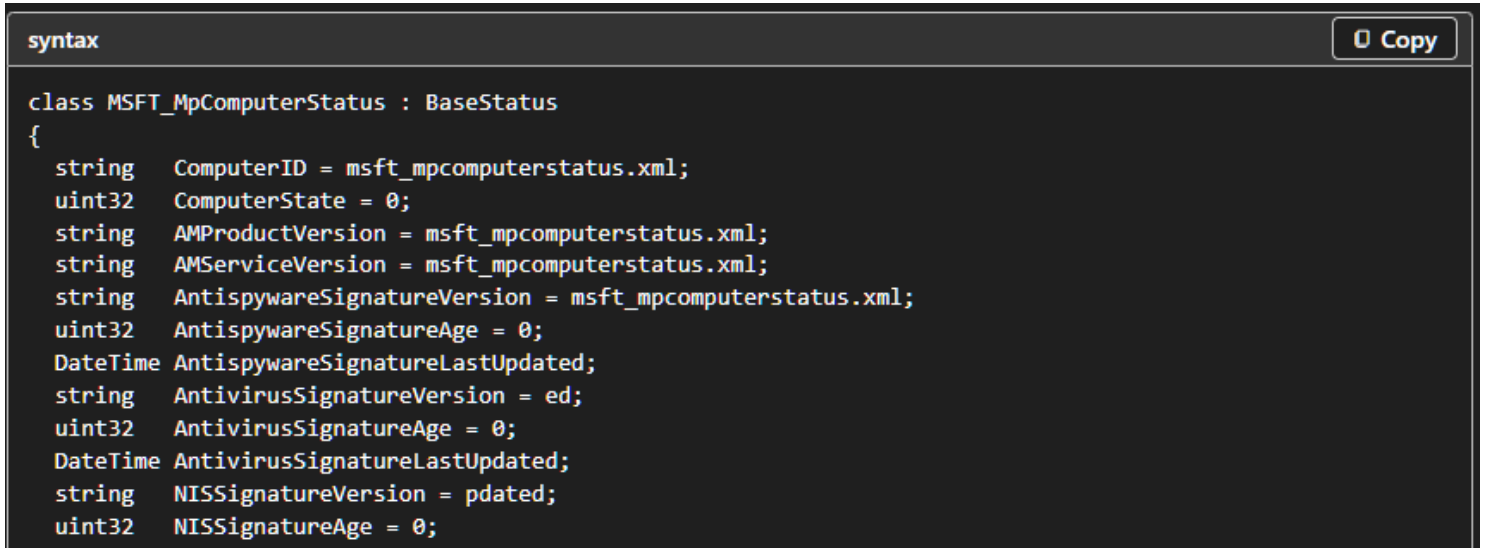
Windows Defender WMI Monitoring

Windows Defender Monitoring through WMI
https://github.com/zabbix/community-templates/tree/main/Operating_Systems/Windows/template_windows_defender_wmi_monitoring/5.0

Tools:

- MSFT_MpComputerStatus class
  - http://learn.microsoft.com/en-us/previous-versions/windows/desktop/defender/msft-mpcomputerstatus



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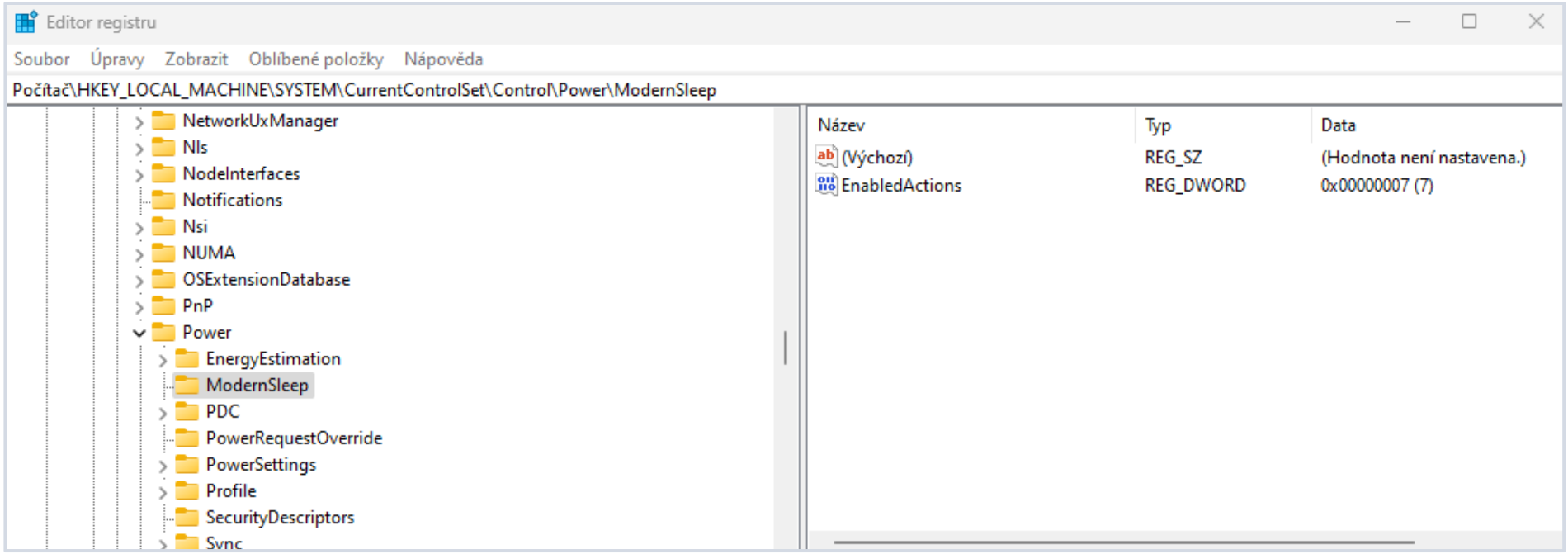
Windows Out-of-the-box items

Registry

- A central hierarchical database used in systems to store information that is necessary to configure the system for one or more users, applications, and hardware devices.
- registry.data
- registry.get



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Advanced Windows monitoring

Windows Out-of-the-box template tuning

Timing

- Update Interval
- Discovery intervals

Throttling

- Discard Unchanged
- Discard Unchanged with Heartbeat

History and Trends

- History storage period
- Trend Storage

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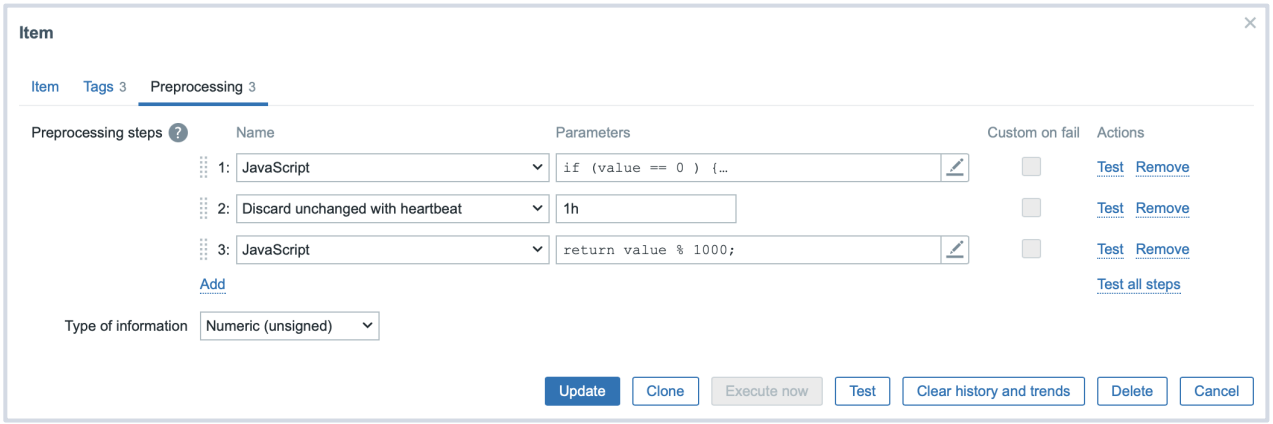
Windows Out-of-the-box template tuning

Throttling

- Throttling Services




```
if (value == 0 ) {
  return value;
} else {
  return (Math.floor(Date.now() / 1000) - 1707000000 )*1000 + value;
}
```

```
return value % 1000;
```

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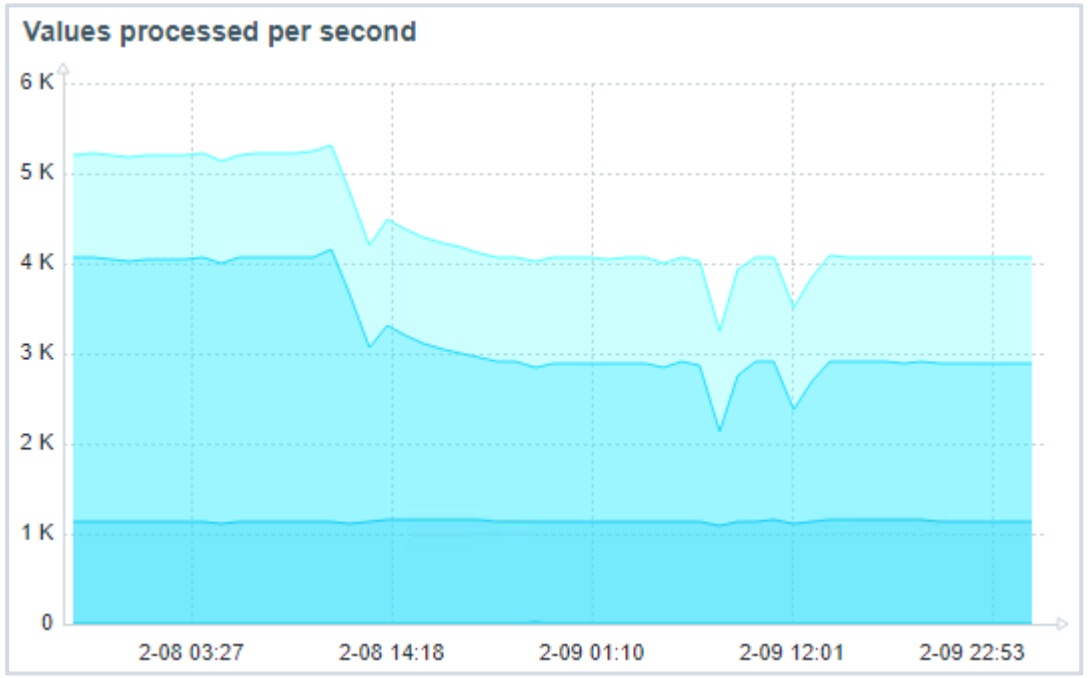
Windows Out-of-the-box template tuning

Throttling

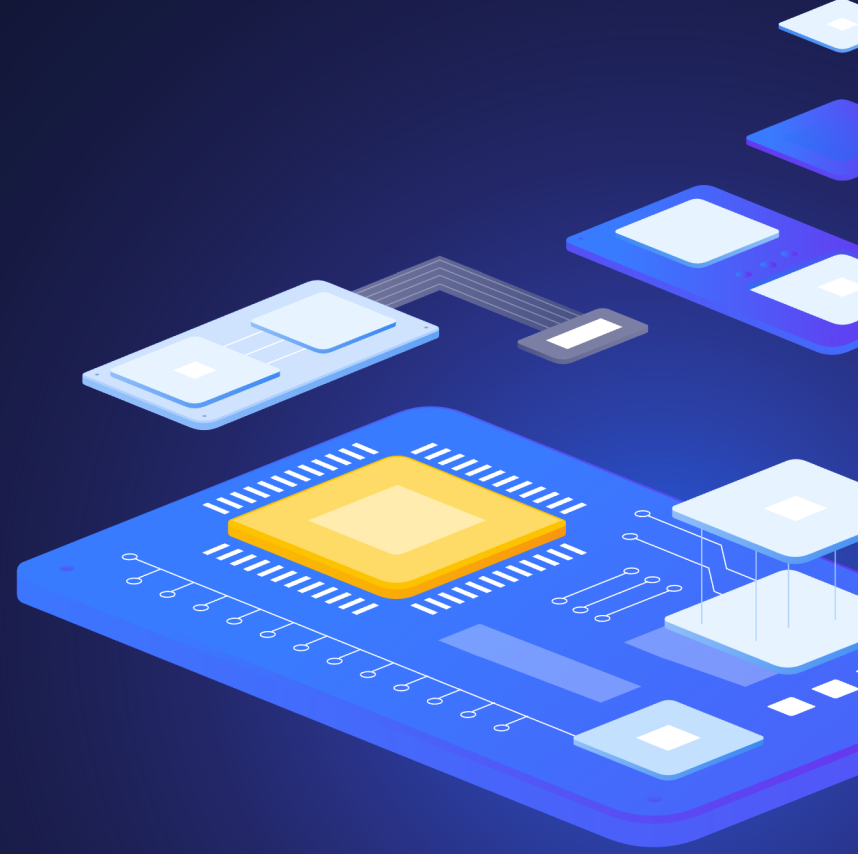
- Throttling Services Result:



- Wiki en: https://www.initmax.com/wiki/throttling-and-false-positives-protection-using-min-max-avg/

2

What & How



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Server types

Server type

- Domain controllers
- Member servers
- Standalone servers

Components

- Availability
- Performance
- Security
- Inventory

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Advanced Windows monitoring

Technologies to monitor

- AD
- DHCP
- DNS
- DFS
- File server + Quotas
- CA
- MSSQL
- Exchange
- IIS
- WSUS
- And more…

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Technologies to use

- Out of the box monitoring
- System.run key
  - **Syntax: system.run[command,<mode>]**
  - command: command that should be executed, i.e., cmd or PowerShell
- User parameters
  - **Syntax: UserParameter=key,[<command>]**
  - Shell commands
  - Custom scripts

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User Parameters

UserParameter examples:

- AD forest information – check FSMO roles
- Calculate GPO running time

```
### Option: UserParameter

UserParameter=getADForestFSMO[*],PowerShell -Command "Get-ADForest $1 |
select SchemaMaster,DomainNamingMaster |ConvertTo-Json"

UserParameter=GPORunTime[*],PowerShell -File "C:\Program Files\Zabbix Agent
2\scripts\GPORunTime.ps1"
```

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system.run[]

AllowKey example:

- Get Windows Updates

```
### Option: AllowKey

system.run["PowerShell \"(New-Object -ComObject
Microsoft.Update.Session).CreateupdateSearcher().Search('IsHidden=0 and
IsInstalled=0').Updates|Select-Object Title |ConvertTo-Json\""]
```

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Active directory - Domain Controller

- Availability
  - FSMO role owners
  - DC diag errors
  - LDAP ports status
  - GC ports status
  - DNS availability
- Performance
  - NTDS.dit filesize
  - EDB.log filesize
  - Deleted object count
  - Replication status
- Security
  - Eventlog monitoring
- Inventory

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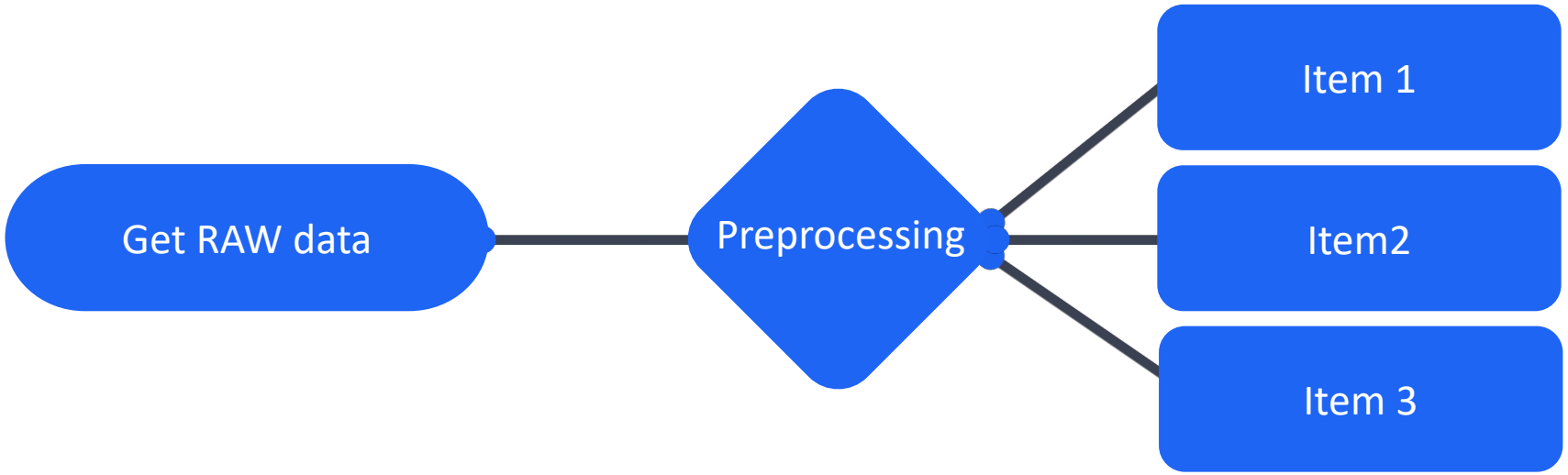
DHCP server

- Availability
  - Service
- Performance
  - Scopes statistics
- Security
- Inventory



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DNS server

- Availability
  - Service state
  - DNS record availability
- Performance
  - Response time
- Security
  - Eventlog security

Agent Items

- net.dns
- net.dns.record
- net.dns.perf
- net.dns.get

DNS Availability	51s	up (1)
DNS Availability	51s	up (1)
DNS status: _gc._tc[redacted]	5s	up (1)
DNS status: _gc._tc[redacted]	27s	up (1)
DNS status: _kerberos._tc[redacted]	7s	up (1)
DNS status: _kerberos._tc[redacted]	29s	up (1)
DNS status: _ldap._tc[redacted]	6s	up (1)
DNS status: _ldap._tc[redacted]	28s	up (1)

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DFS server

- Availability
  - Service
  - DFS-N status
  - DFS-R status

```
### Get DFS Namespace Folders
(Get-DfsnRoot -Domain <domain>).Path |
     % { (Get-DfsnFolder -Path (Join-Path -Path $_ -ChildPath "\*")).Path } |
     % { Get-DfsnFolderTarget -Path $_ | select Path, TargetPath, State } |
     sort Path | ConvertTo-Json
```

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File server

- Availability
  - Service, Shares
- Performance
  - Quota monitoring
  - I/O Stats
  - Network traffic

Host	Name ▲	Last check	Last value
DC01	E:\Home\Loza - [Omezeni Ucitele Soft 2G]: Size	2m 2s	2 GB
DC01	E:\Home\Loza - [Omezeni Ucitele Soft 2G]: SoftLimit	2m 2s	true
DC01	E:\Home\Loza - [Omezeni Ucitele Soft 2G]: Usage	2m 2s	561.3 MB
DC01	E:\Home\Loza - [Omezeni Ucitele Soft 2G]: Usage %	2m 2s	27.4073 %

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Certificates and Certificate authority

- Published certificates
  - Out of the box certificate monitoring
- Stored certificates (certificates residing in the Windows Certificate Store)
  - Microsoft cryptoapi
  - File stored certificates
- Certificate Authority
  - Availability
  - Service
  - Certificate status
- Performance

Advanced Windows monitoring

MSSQL Server

MSSQL by Zabbix agent 2

- Zabbix agent 2 plugin extension
- https://www.zabbix.com/integrations/mssql#mssql_agent2

Name	Description	Type	Key and additional info
Service's TCP port state	Test the availability of MSSQL Server on a TCP port.	Simple check	net.tcp.service[tcp,{$MSSQL.HOST},{$MSSQL.PORT}] **Preprocessing** • Discard unchanged with heartbeat: `10m`
Get last backup	The item gets information about backup processes.	Zabbix agent	mssql.last.backup.get["{$MSSQL.URI}","{$MSSQL.USER}","{$MSSQL.PASSWORD}"]
Get job status	The item gets the SQL agent job status.	Zabbix agent	mssql.job.status.get["{$MSSQL.URI}","{$MSSQL.USER}","{$MSSQL.PASSWORD}"]
Get performance counters	The item gets server global status information.	Zabbix agent	mssql.perfcounter.get["{$MSSQL.URI}","{$MSSQL.USER}","{$MSSQL.PASSWORD}"]

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MSSQL Server

MSSQL by ODBC

- Availability
  - Service
- Performance
  - Scopes statistics
- Security
- Inventory

Advanced Windows monitoring

Exchange Server

Microsoft Exchange Server 2016 by Zabbix agent

- Availability
- Performance
  - Server Counters
  - Discovery
    - Databases
    - LDAP
    - Web Services
- Statistics
  - PowerShell + UserParameters

[redacted]AvailableNewMailboxSpace	6m 59s	55 MB
[redacted]Database Size	6m 59s	76.88 GB
[redacted]Mounted	6m 59s	1
[redacted]Status	6m 59s	Mounted
[redacted]AvailableNewMailboxSpace	6m 59s	844 MB
[redacted]Database Size	6m 59s	117.13 GB
[redacted]Mounted	6m 59s	1
[redacted]Status	6m 59s	Mounted
[redacted]AvailableNewMailboxSpace	6m 59s	396 MB
[redacted]Database Size	6m 59s	54 GB
[redacted]Mounted	6m 59s	1
[redacted]Status	6m 59s	Mounted

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IIS Server (Microsoft Web Server)

IIS by Zabbix agent

- Availability
  - service.info[WAS]
  - service.info[W3SVC]
  - net.tcp.service[{$IIS.SERVICE},,{$IIS.PORT}]
- Performance
  - perf_counter_en["\Web Service(_Total)\Bytes Received/sec", 60]
  - …
  - Application pools Discovery
    - Pool prototypes – perf_counter_en

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WSUS Server

Windows Server Update Service Community template

- Availability
  - service.info[WsusService]
- Performance
  - Application pools Discovery

Last synchronization process start time	38m 38s	2024-02-27 09:50:42 PM
Last synchronization process status	38m 39s	Succeeded
Number of "NotApproved" critical or security updates	38m 31s	19009
Number of "ServerErrors" updates	38m 21s	0
Number of clients updated with fails	38m 32s	2
Number of days from last synchronization	38m 40s	0
Total number of updates	38m 26s	22041
WSUS Server version	38m 41s	10.0.20348.143

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Summary and recommendations!

Use Zabbix Agent 2

- Use Zabbix Agent 2 - internal items (performance counters, WMI checks, registry)
- Extend agent functionality with UserParameters and system.run keys
- Use dependent items
- Do not overload PowerShell
- Customize update interval
- Customize History and Trend storage

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Tips and tricks

Check our wiki and social networks regularly for tips and updates

Tips and tricks on our webpage:

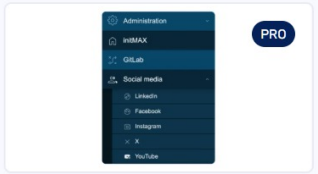
- https://www.initmax.com/wiki/frontend-scripts-and-sudo-in-zabbix/
- https://www.initmax.com/wiki/zabbix-java-gateway-installation-with-tomcat-monitoring/
- https://www.initmax.com/wiki/zabbix-7-0-instructions-for-installation-in-5-minutes/
- https://www.initmax.com/wiki/zabbix-7-0-and-increasing-system-limits/
- https://www.initmax.com/wiki/zabbix-migration-from-mysql-to-postgresql/
- https://www.initmax.com/wiki/how-to-set-up-snmp-trap-in-zabbix/
- https://www.initmax.com/wiki/microsoft-teams-integration-in-five-steps/
- https://www.initmax.com/wiki/reporting-in-zabbix-7-0/

Advanced Windows monitoring

initMAX E-Shop

- Custom visualization widgets
- UX Improvement Modules
- AI Integration with Zabbix
- Both **FREE** and PRO Versions

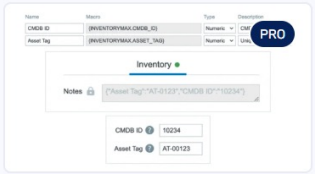
- initMAX e-shop
  https://www.initmax.com/eshop/



Custom menu buttons

ZABBIX Module

This module enables creation of custom navigation menu buttons and groups with user-defined URL links, allowing for personalized interface navigation.



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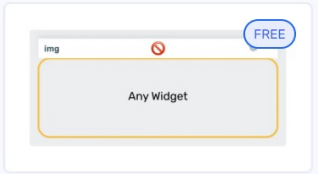
ZABBIX Module

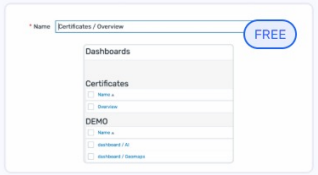
inventoryMAX adds custom fields to Zabbix inventory for flexible, structured metadata management and seamless macro-based integration.



Hide widget header

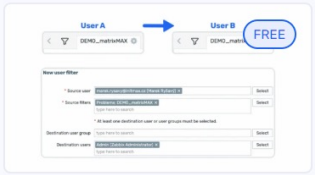
ZABBIX Module

This module prevents widget headers from being displayed when dashboards are not in edit mode, improving visual clarity and user experience.



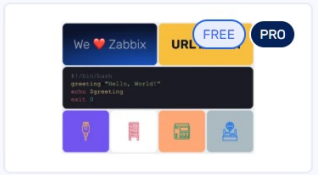
Structured dashboards

ZABBIX Module



User filter manager

ZABBIX Module



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ZABBIX Widget

- Video explanation of widgets and modules
  https://www.youtube.com/watch?v=fpW6TR7DQdU&list=PLF7Hh_ikyQDpHiHhXwLtw57OCDF9jn7zL

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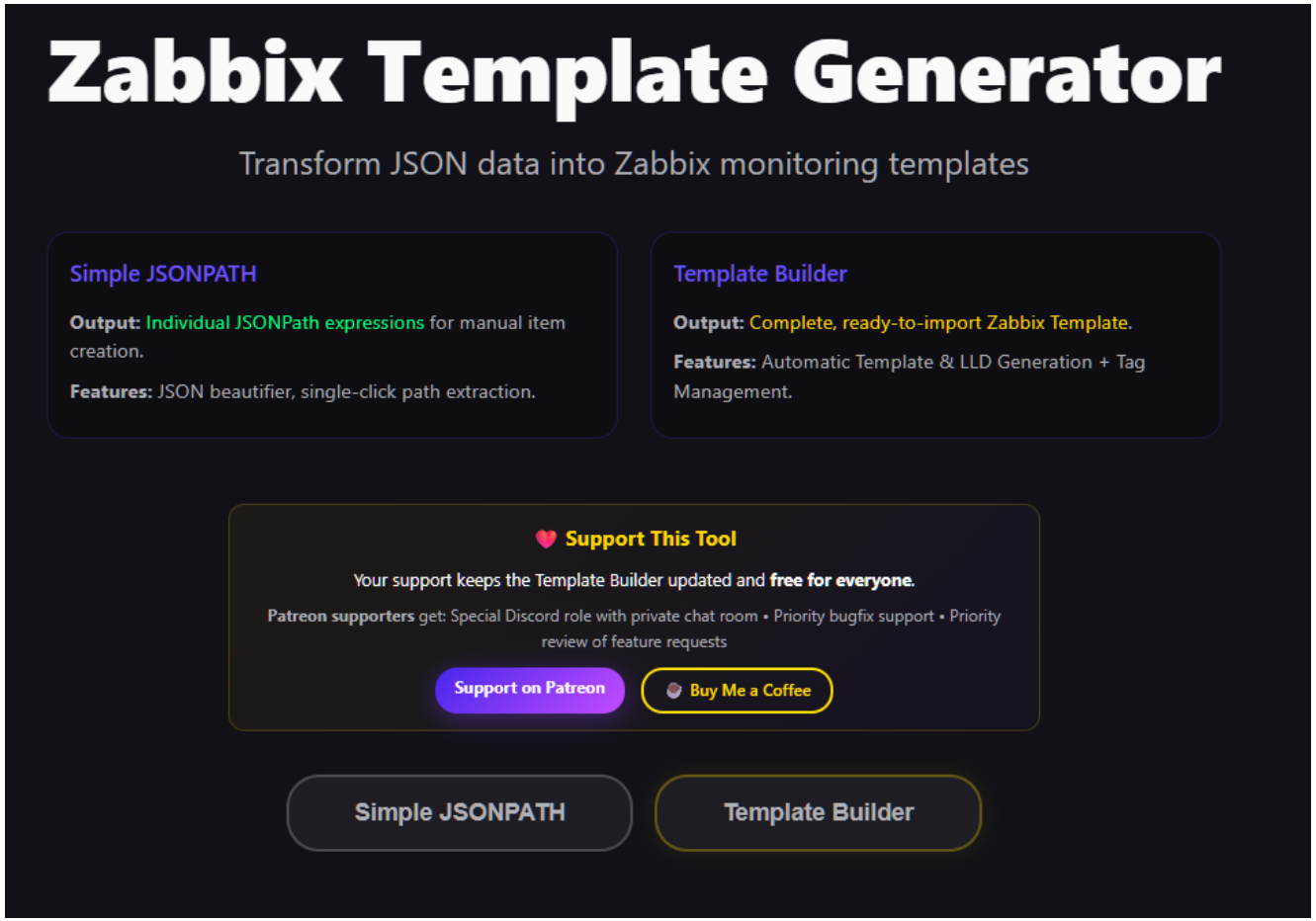
Advanced Windows monitoring

Free Zabbix template builder

- FREE template builder from JSON
- Tag support
- Low-Level Discovery support
- Zabbix 7.0 / 7.2 / 7.4 support
- Extract simple JSONPath
- Download a ready-to-apply template

- www.dmitrylambert.com



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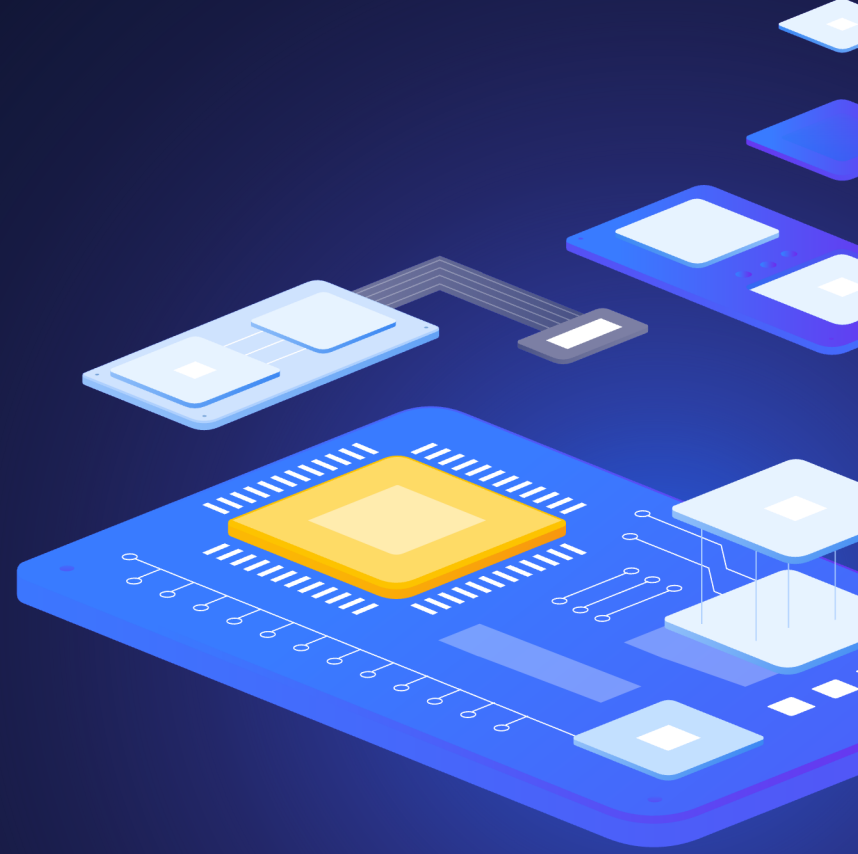
Questions?



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Contact us:

Phone:	+420 800 244 442
Web:	https://www.initmax.com
Email:	tomas.hermanek@initmax.com
LinkedIn:	https://www.linkedin.com/company/initmax
Twitter:	https://twitter.com/initmax
Tomáš Heřmánek:	+420 732 447 184