

LLD OVERRIDES

A BRIEF INTRODUCTION TO LLD OVERRIDES



WHAT ARE OVERRIDES?

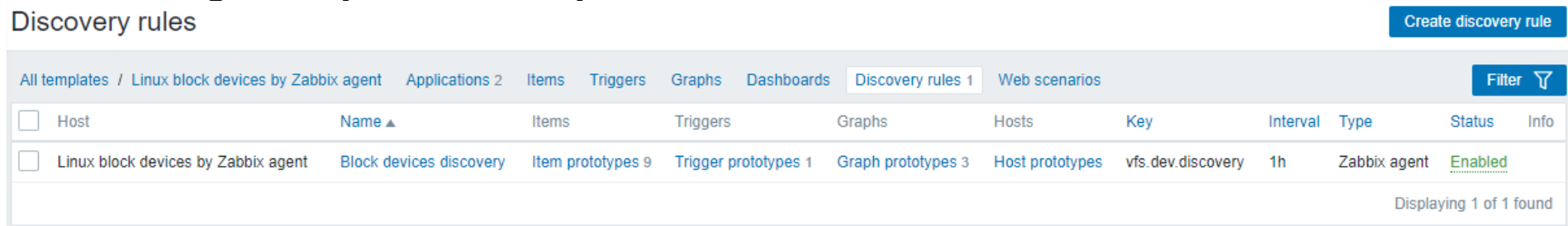
- ✔ Introduced in version 5.0
- ✔ LLD overrides allow us to set rules to modify the list of item, trigger, graph and host prototypes or their attributes for discovered objects that meet given criteria.
- ✔ LLD Filters, however, filters out the entity completely, that's why we need overrides!



WHERE TO FIND OVERRIDES?

- ☑ Navigate to your discovery rule

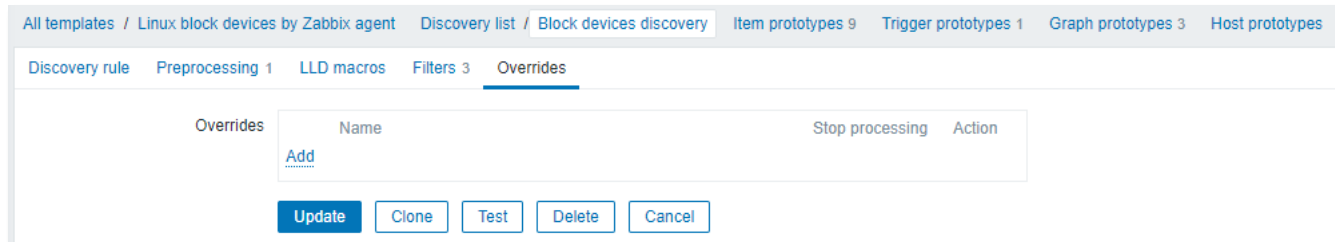
Discovery rules



The screenshot shows the Zabbix web interface for managing discovery rules. At the top right, there is a blue button labeled "Create discovery rule". Below the breadcrumb navigation, there is a "Filter" button with a dropdown arrow. The main content is a table with the following columns: Host, Name, Items, Triggers, Graphs, Hosts, Key, Interval, Type, Status, and Info. One rule is listed: "Linux block devices by Zabbix agent" with a status of "Enabled". At the bottom right of the table, it says "Displaying 1 of 1 found".

<input type="checkbox"/>	Host	Name ▲	Items	Triggers	Graphs	Hosts	Key	Interval	Type	Status	Info
<input type="checkbox"/>	Linux block devices by Zabbix agent	Block devices discovery	Item prototypes 9	Trigger prototypes 1	Graph prototypes 3	Host prototypes	vfs.dev.discovery	1h	Zabbix agent	Enabled	

- ☑ Switch to Overrides tab



The screenshot shows the "Overrides" tab within the Zabbix interface. The breadcrumb navigation includes "Discovery rule", "Preprocessing 1", "LLD macros", "Filters 3", and "Overrides". Below the navigation, there is a table with columns for "Name", "Stop processing", and "Action". An "Add" link is present below the "Name" column. At the bottom, there are five buttons: "Update", "Clone", "Test", "Delete", and "Cancel".

Overrides	Name	Stop processing	Action
Add			

[Update](#) [Clone](#) [Test](#) [Delete](#) [Cancel](#)



HOW TO CONFIGURE OVERRIDES?

- ✔ Click on Add in the Overrides block. To edit an existing override, click on the override name
- ✔ Create a name for the override
- ✔ Configure your override filters
- ✔ To configure details of a new operation, click on Add within the form of an override. To edit an existing operation, click on Edit next to the operation
- ✔ All mandatory fields are marked with a red asterisk



USE CASES

- ☑ You wish to:
 - Monitor Windows services with a few exceptions
 - Monitor Partitions with different item update intervals
 - Assign different trigger severities for your DB tables
 - Create item prototypes in disabled state for later review



RUNNING THE DISCOVERY

- ✔ Create a discovery rule or assign a template: Linux filesystems by zabbix agent

All templates / Linux filesystems by Zabbix agent / Discovery list / Mounted filesystem discovery / Item prototypes 4 / Trigger prototypes 4 / Graph prototypes 1 / Host prototypes

Discovery rule / Preprocessing / LLD macros / Filters 4 / Overrides

* Name

Type

* Key

* Update interval

Custom intervals	Type	Interval	Period	Action
	<input type="checkbox"/> Flexible <input checked="" type="checkbox"/> Scheduling	<input type="text" value="50s"/>	<input type="text" value="1-7,00:00-24:00"/>	Remove
	Add			

- ✔ Manually execute the Mounted filesystem discovery rule
- ✔ Take note of the discovered items and triggers

RUNNING THE DISCOVERY

- ✔ You now have items created by the discovery rule
- ✔ Items created by LLD rules will have a prefix containing the parent LLD
- ✔ Item names expand LLD macro {#FSNAME}

<input type="checkbox"/> Wizard	Name ▲	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>	Mounted filesystem discovery: /: Free inodes in %	Triggers 2	vfs.fs.inode[/,pfree]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /: Space utilization	Triggers 2	vfs.fs.size[/,pused]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /: Total space	Triggers 2	vfs.fs.size[/,total]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /: Used space	Triggers 2	vfs.fs.size[/,used]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /boot: Free inodes in %	Triggers 2	vfs.fs.inode[/boot,pfree]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /boot: Space utilization	Triggers 2	vfs.fs.size[/boot,pused]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /boot: Total space	Triggers 2	vfs.fs.size[/boot,total]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>	Mounted filesystem discovery: /boot: Used space	Triggers 2	vfs.fs.size[/boot,used]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	



RUNNING THE DISCOVERY

- JSON created by Zabbix

```
[{"#FSNAME": "/sys", "#FSTYPE": "sysfs"}, {"#FSNAME": "/proc", "#FSTYPE": "proc"}, {"#FSNAME": "/dev", "#FSTYPE": "devtmpfs"}, {"#FSNAME": "/sys/kernel/security", "#FSTYPE": "securityfs"}, ...]
```

- Zabbix_get utility or test form within frontend can be used to extract the JSON created

Test item

Get value from host

* Host address Port

Proxy

Value

Time

Previous value

Prev. time

End of line sequence

RUNNING THE DISCOVERY

- ☑ Two filesystems are found "/" and "/boot"
- ☑ Let's see what happens if additional filesystems appear on our host

```
# mkdir /l1dfs
```

```
# mount --bind /var/log/zabbix/ /l1dfs/
```

```
[root@localhost ~]# mount | grep l1dfs  
/dev/mapper/cl-root on /l1dfs type xfs (rw,relatime,attr2,inode64,noquota)
```

- ☑ Execute the discovery rule again



RUNNING THE DISCOVERY

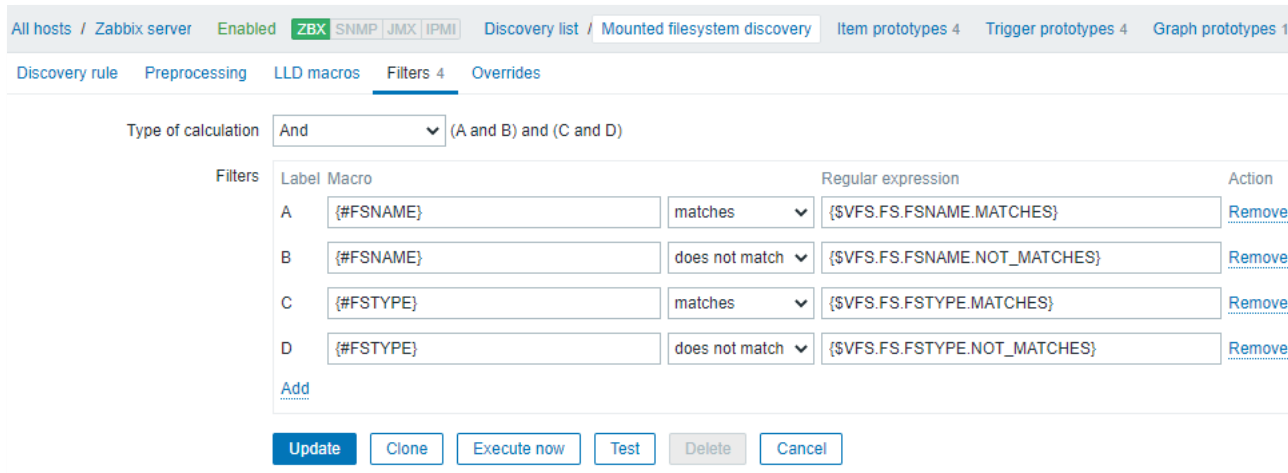
- ☑ Our new dummy filesystem is now monitored automatically

<input type="checkbox"/>	Wizard	Name ▲	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>		Mounted filesystem discovery: /: Free inodes in %	Triggers 2	vfs.fs.inode[/,pfree]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Space utilization	Triggers 2	vfs.fs.size[/,pused]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Total space	Triggers 2	vfs.fs.size[/,total]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Used space	Triggers 2	vfs.fs.size[/,used]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Free inodes in %	Triggers 2	vfs.fs.inode[/boot,pfree]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Space utilization	Triggers 2	vfs.fs.size[/boot,pused]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Total space	Triggers 2	vfs.fs.size[/boot,total]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Used space	Triggers 2	vfs.fs.size[/boot,used]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input checked="" type="checkbox"/>		Mounted filesystem discovery: //ldfs: Free inodes in %	Triggers 2	vfs.fs.inode[//ldfs,pfree]	1m	7d	365d	Zabbix agent	Filesystem //ldfs	Enabled	
<input checked="" type="checkbox"/>		Mounted filesystem discovery: //ldfs: Space utilization	Triggers 2	vfs.fs.size[//ldfs,pused]	1m	7d	365d	Zabbix agent	Filesystem //ldfs	Enabled	
<input checked="" type="checkbox"/>		Mounted filesystem discovery: //ldfs: Total space	Triggers 2	vfs.fs.size[//ldfs,total]	1m	7d	365d	Zabbix agent	Filesystem //ldfs	Enabled	
<input checked="" type="checkbox"/>		Mounted filesystem discovery: //ldfs: Used space	Triggers 2	vfs.fs.size[//ldfs,used]	1m	7d	365d	Zabbix agent	Filesystem //ldfs	Enabled	



RUNNING THE DISCOVERY

- ❑ If we were to use a filter, our items would simply be removed/not created
- ❑ Our template filters reference user defined macros on a template level
- ❑ We are interested in filtering out a filesystem name



The screenshot shows the Zabbix configuration interface for LLD filters. The breadcrumb navigation indicates the path: All hosts / Zabbix server / Enabled / ZBX / SNMP / JMX / IPMI / Discovery list / Mounted filesystem discovery / Item prototypes 4 / Trigger prototypes 4 / Graph prototypes 1. The current view is 'Filters 4' under the 'Mounted filesystem discovery' rule. The 'Type of calculation' is set to 'And' with a sub-note '(A and B) and (C and D)'. There are four filters defined:

Label	Macro	Operator	Regular expression	Action
A	{#FSNAME}	matches	{SVFS.FS.FSNAME.MATCHES}	Remove
B	{#FSNAME}	does not match	{SVFS.FS.FSNAME.NOT_MATCHES}	Remove
C	{#FSTYPE}	matches	{SVFS.FS.FSTYPE.MATCHES}	Remove
D	{#FSTYPE}	does not match	{SVFS.FS.FSTYPE.NOT_MATCHES}	Remove

At the bottom, there are buttons for 'Update', 'Clone', 'Execute now', 'Test', 'Delete', and 'Cancel'. An 'Add' link is also present below the filter list.

RUNNING THE DISCOVERY

- ✓ We will add "lldfs" to macro value

`{$VFS.FS.FSNAME.NOT_MATCHES}` `^(/dev/sys/run/proc|.+shm/lldfs$)` T [Remove](#) ← Linux filesystems by Zabbix agent: "^(/dev/sys/run/p.

This macro is used in filesystems discovery. Can be overridden on the host or linked template level

- ✓ Reload configuration cache
- ✓ Run LLD rule once more



RUNNING THE DISCOVERY

- ⊗ Note that the items filtered out are still present due to “Keep lost resources” setting
- ⊗ Items will not be removed instantly, unless 0 value is specified

<input type="checkbox"/>	Mounted filesystem discovery: /ldfs: Free inodes in %	Triggers 2	vfs.fs.inode[/ldfs,pfree]	1m	7d	365d	Zabbix agent	Filesystem	Enabled	i
<input type="checkbox"/>	Mounted filesystem discovery: /ldfs: Space utilization	Triggers 2	vfs.fs.size[/ldfs,pused]	1m	7d	365d	Zabbix agent	Filesystem	Enabled	i
<input type="checkbox"/>	Mounted filesystem discovery: /ldfs: Total space	Triggers 2	vfs.fs.size[/ldfs,total]	1m	7d	365d	Zabbix agent	Filesystem	Enabled	i
<input type="checkbox"/>	Mounted filesystem discovery: /ldfs: Used space	Triggers 2	vfs.fs.size[/ldfs,used]	1m	7d	365d	Zabbix agent	Filesystem	Enabled	i

The item is not discovered anymore and will be deleted in 29d 23h 58m (on 2020-12-03 at 22:56)

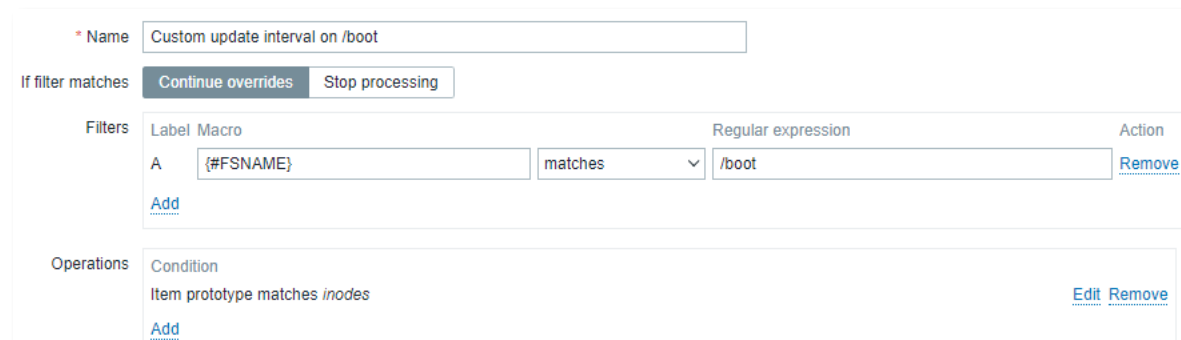
- ⊗ what if we do not wish to remove ALL of the elements related to the dummy filesystem? Or what if we wish to change some of them - change update intervals, create some of the triggers in a disabled state, change trigger severities



OVERRIDE!

Add an override to Mounted filesystem discovery LLD

- ✔ Edit the discovery rule, create first override: "Custom update interval on /boot"
- ✔ Use a filter for the filesystem name which matches /boot
- ✔ Change the update interval to 1h for item prototypes containing the word "inodes"
- ✔ Note that you cannot add an override on a host level, if the discovery rule is linked from a template



The screenshot displays the configuration for a discovery rule override in Zabbix. The configuration is as follows:

Label	Macro	Regular expression	Action
A	{#FSNAME}	/boot	Remove

Operations:

Condition	Action
Item prototype matches <i>inodes</i>	Edit Remove

OVERRIDE!

- ☑ Reload your configuration cache
- ☑ Take a look at your discovered items:

<input type="checkbox"/>	Wizard	Name ▲	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>		Mounted filesystem discovery: /: Free inodes in %	Triggers 2	vfs.fs.inode[/,pfree]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Space utilization	Triggers 2	vfs.fs.size[/,pused]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Total space	Triggers 2	vfs.fs.size[/,total]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Used space	Triggers 2	vfs.fs.size[/,used]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input checked="" type="checkbox"/>		Mounted filesystem discovery: /boot: Free inodes in %	Triggers 2	vfs.fs.inode[/boot,pfree]	1h	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Space utilization	Triggers 2	vfs.fs.size[/boot,pused]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Total space	Triggers 2	vfs.fs.size[/boot,total]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Used space	Triggers 2	vfs.fs.size[/boot,used]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	

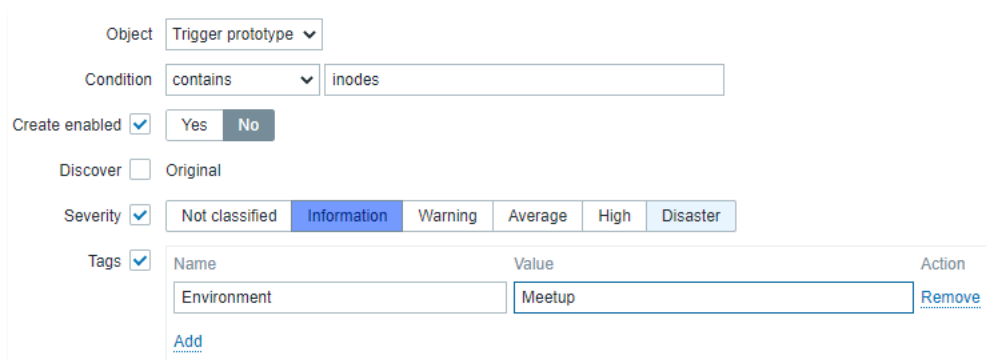
- ☑ The item “/boot: Free inodes in %” is now updated every 1h



OVERRIDE!

Let's add another override – trigger prototype override

- ✓ Add the 2nd override: “/boot inode trigger override”
- ✓ For inodes triggers change the severity level to “Information”
- ✓ Specify to create these triggers in a disabled state
- ✓ And assign a tag “Environment” : “Meetup”



The screenshot shows a configuration interface for a trigger prototype. The settings are as follows:

- Object:** Trigger prototype (dropdown)
- Condition:** contains (dropdown) | inodes (text input)
- Create enabled:** Yes No
- Discover:** Original
- Severity:** Not classified Information Warning Average High Disaster
- Tags:**

Name	Value	Action
Environment	Meetup	Remove

[Add](#)

OVERRIDE!

Check if all of the overrides apply to already created elements (triggers):

- ✔ Has the severity been changed?
- ✔ Are the triggers properly tagged?
- ✔ Has their status changed from enabled to disabled?



OVERRIDE!

- ☑ Triggers that were created before, are still enabled
- ☑ Both triggers have changed severities

<input type="checkbox"/>	Severity	Value	Name ▲	Operational data	Expression	Status	Info	Tags
<input type="checkbox"/>	Average	OK	Mounted filesystem discovery: /: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.CRIT:"/"}%)	Free inodes: {ITEM.LASTVALUE1}	{Zabbix server.vfs.fs.inode[/,pfree].min(5m)}<{\$VFS.FS.INODE.PFREE.MIN.CRIT:"/"}	Enabled		
<input type="checkbox"/>	Warning	OK	Mounted filesystem discovery: /: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.WARN:"/"}%) Depends on: Zabbix server: /: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.CRIT:"/"}%)	Free inodes: {ITEM.LASTVALUE1}	{Zabbix server.vfs.fs.inode[/,pfree].min(5m)}<{\$VFS.FS.INODE.PFREE.MIN.WARN:"/"}	Enabled		
<input type="checkbox"/>	Information	OK	Mounted filesystem discovery: /boot: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.CRIT:"/boot"}%)	Free inodes: {ITEM.LASTVALUE1}	{Zabbix server.vfs.fs.inode[/boot,pfree].min(5m)}<{\$VFS.FS.INODE.PFREE.MIN.CRIT:"/boot"}	Enabled		Environment: Meetup
<input type="checkbox"/>	Information	OK	Mounted filesystem discovery: /boot: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.WARN:"/boot"}%) Depends on: Zabbix server: /boot: Running out of free inodes (free < {\$VFS.FS.INODE.PFREE.MIN.CRIT:"/boot"}%)	Free inodes: {ITEM.LASTVALUE1}	{Zabbix server.vfs.fs.inode[/boot,pfree].min(5m)}<{\$VFS.FS.INODE.PFREE.MIN.WARN:"/boot"}	Enabled		Environment: Meetup



STOP PROCESSING

- ✓ On /boot inode trigger discovery select "Stop processing" if filter matches
- ✓ Add a third override: "Stop discovery of filesystems if no boot partition"
- ✓ Filter the override by {#FSNAME} = /
- ✓ If the filter matches, "/" FS item discovery will not take place
- ✓ Reload the configuration cache and rerun the discovery

<input type="checkbox"/>	Wizard	Name ▲	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>		Mounted filesystem discovery: /: Free inodes in %	Triggers 2	vfs.fs.inode[/,pfree]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Space utilization	Triggers 2	vfs.fs.size[/,pused]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Total space	Triggers 2	vfs.fs.size[/,total]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /: Used space	Triggers 2	vfs.fs.size[/,used]	1m	7d	365d	Zabbix agent	Filesystem /	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Free inodes in %	Triggers 2	vfs.fs.inode[/boot,pfree]	1h	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Space utilization	Triggers 2	vfs.fs.size[/boot,pused]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Total space	Triggers 2	vfs.fs.size[/boot,total]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Used space	Triggers 2	vfs.fs.size[/boot,used]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	



STOP PROCESSING

- ⊘ Lets see what would've change if we would not use "Stop processing"

Overrides	Name	Stop processing	Action
<input type="checkbox"/>	1: Custom update interval on /boot	No	Remove
<input type="checkbox"/>	2: /boot inode trigger override	No	Remove
<input type="checkbox"/>	3: Stop discovery of filesystems if no boot partition	No	Remove
Add			

- ⊘ In this case, all of our filesystem items will not be discovered

<input type="checkbox"/>	Wizard	Name ▲	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Free inodes in %	Triggers 2	vfs.fs.inode[/boot,pfree]	1h	7d	365d	Zabbix agent	Filesystem /boot	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Space utilization	Triggers 2	vfs.fs.size[/boot,pused]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Total space	Triggers 2	vfs.fs.size[/boot,total]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /boot: Used space	Triggers 2	vfs.fs.size[/boot,used]	1m	7d	365d	Zabbix agent	Filesystem /boot	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /lldfs: Free inodes in %	Triggers 2	vfs.fs.inode[/lldfs,pfree]	1m	7d	365d	Zabbix agent	Filesystem /lldfs	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /lldfs: Space utilization	Triggers 2	vfs.fs.size[/lldfs,pused]	1m	7d	365d	Zabbix agent	Filesystem /lldfs	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /lldfs: Total space	Triggers 2	vfs.fs.size[/lldfs,total]	1m	7d	365d	Zabbix agent	Filesystem /lldfs	Enabled	i
<input type="checkbox"/>		Mounted filesystem discovery: /lldfs: Used space	Triggers 2	vfs.fs.size[/lldfs,used]	1m	7d	365d	Zabbix agent	Filesystem /lldfs	Enabled	i



COMMON MISCONFIGURATION

- ⊘ Stop processing if filter matches usage:

Name	Stop processing	Filter	(Operations) Object	(Operations) Condition	(Operations) Severity
Override1	YES	{#FSNAME} matches /boot	Trigger prototype	contains "Disk space is low"	Disaster
Override2	YES	{#FSNAME} matches /	Trigger prototype	contains "Disk space is low"	Information

```
[{ "#FSNAME":" "/" , "#FSTYPE":"ext4" }, { "#FSNAME":"/boot",  
"#FSTYPE":"ext4" }]
```



NOTES

- ⊗ The option "Create enabled" is affecting only the newly created entities.
- ⊗ Override order is important
- ⊗ Overrides cannot be created on host level if LLD rule is assigned by template
- ⊗ Typos. Always check for typos.



GOOD LUCK DISCOVERING

THANK YOU!

