10TH ZABBIX SUMMIT 2022

DISCOVERING AND MANAGING HOSTS WITH IMPROVED ZABBIX HOST PROTOTYPES IN ZABBIX 6.2

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Chief trainer

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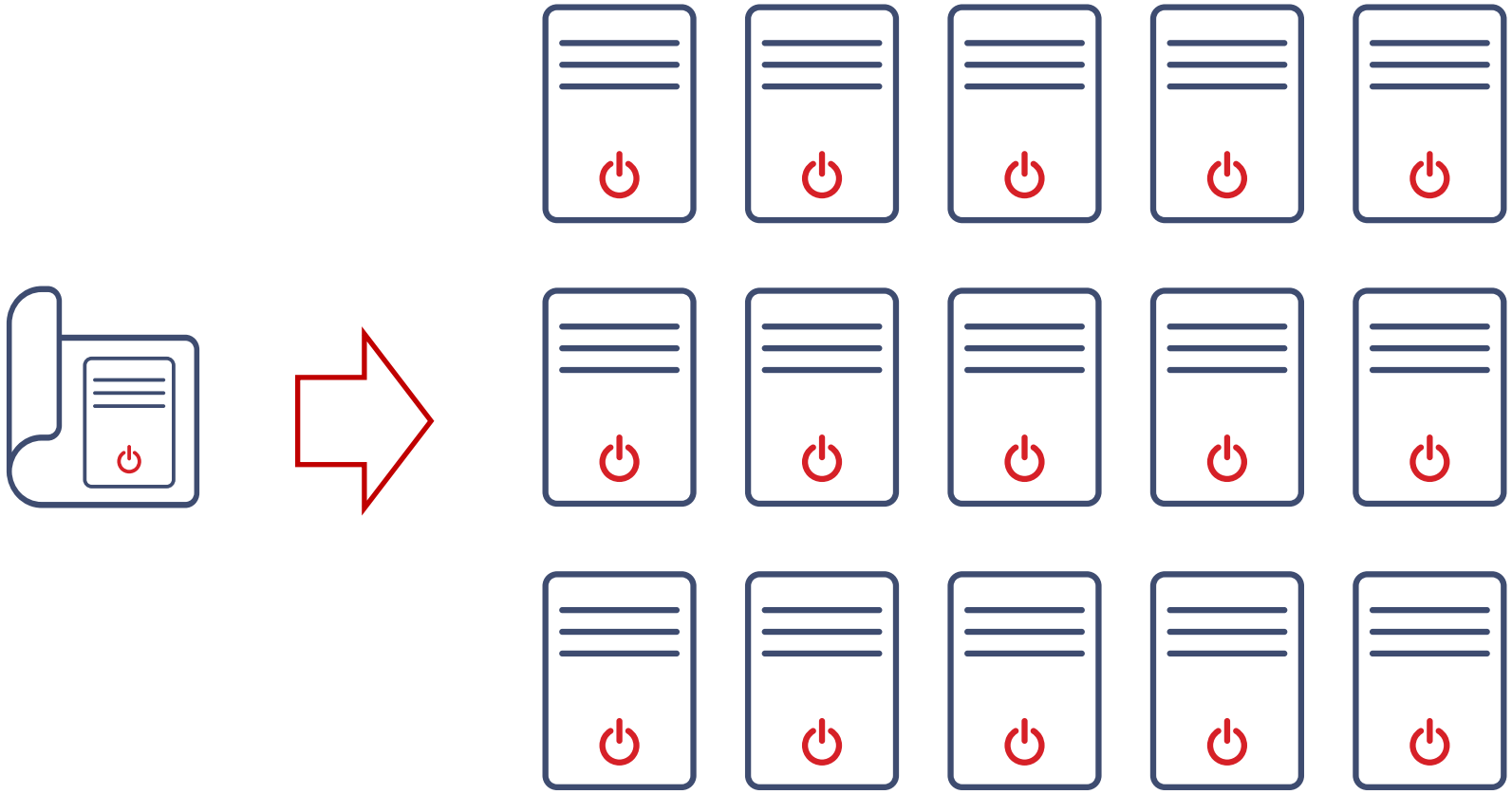
WHAT ARE HOST PROTOTYPES

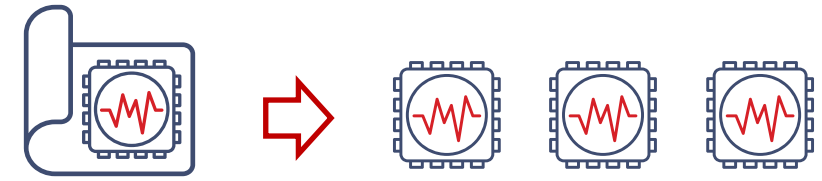
WHAT ARE HOST PROTOTYPES?

- Host prototypes are blueprints for hosts created by Low Level Discovery rules

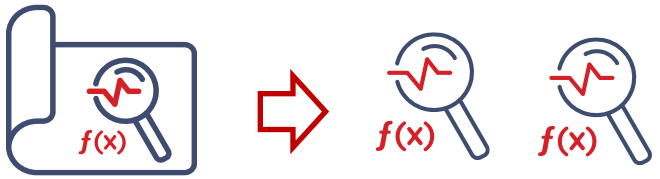


HOW HOST PROTOTYPES WORK?

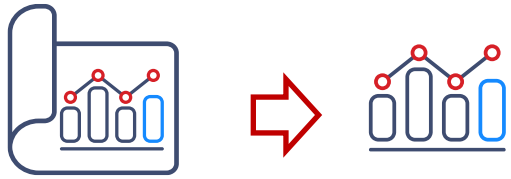
Host



Item prototype



Trigger prototype



Graph prototype

Host prototype

Template	Name ▲	Items	Triggers	Graphs	Hosts	Key	Interval	Type	Status
VMware	Discover VMware clusters	Item prototypes 1	Trigger prototypes	Graph prototypes	Host prototypes	vmware.cluster.discovery[{$VMWARE.URL}]	1h	Simple check	Enabled
VMware	Discover VMware datastores	Item prototypes 4	Trigger prototypes	Graph prototypes	Host prototypes	vmware.datastore.discovery[{$VMWARE.URL}]	1h	Simple check	Enabled
VMware	Discover VMware hypervisors	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes 1	vmware.hv.discovery[{$VMWARE.URL}]	1h	Simple check	Enabled
VMware	Discover VMware VMs	Item prototypes	Trigger prototypes	Graph prototypes	Host prototypes 1	vmware.vm.discovery[{$VMWARE.URL}]	1h	Simple check	Enabled

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Host | Tags | Macros 1 | Inventory | Encryption

* Host name: {#VM.UUID}

Visible name: {#VM.NAME}

Templates: Name: VMware Guest — Action: Unlink

type here to search — Select

* Host groups: Applications ×

type here to search — Select

Group prototypes:

{#CLUSTER.NAME} (vm) — Remove

{#DATACENTER.NAME}/{#VM.FOLDER} (vm) — Remove

{#HV.NAME} — Remove

Add

Interfaces: Inherit | Custom

Type	IP address	DNS name	Connect to	Port	Default
Agent	{#VM.IP}		IP / DNS	10050	Remove

Add

HOW HOST PROTOTYPES ARE CREATED

- Low Level Discovery (LLD) Rule is executed, and JSON data structure is created
- Based on host prototype definitions new hosts are created automatically
- Hosts can also be modified or deleted based on LLD results

Name ▲	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability	Agent encryption	Info	Tags
Discover VMware hypervisors: 192.168.3.67	Items 32	Triggers 7	Graphs	Discovery 2	Web	192.168.3.67:10050		VMware Hypervisor	Enabled	ZBX	None		
Discover VMware hypervisors: 192.168.3.80	Items 42	Triggers 9	Graphs	Discovery 2	Web	192.168.3.80:10050		VMware Hypervisor	Enabled	ZBX	None		
Discover VMware VMs: centos7-amd64-zabbix-agent-build	Items 49	Triggers 1	Graphs	Discovery 3	Web	192.168.12.80:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: centos8-amd64-zabbix-agent-build	Items 49	Triggers 1	Graphs	Discovery 3	Web	192.168.12.78:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: kubernetes-node1	Items 54	Triggers 1	Graphs	Discovery 3	Web	192.168.7.213:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: kubernetes-node2	Items 54	Triggers 1	Graphs	Discovery 3	Web	192.168.7.214:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: kubernetes-node3	Items 54	Triggers 1	Graphs	Discovery 3	Web	192.168.7.215:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: kubernetes-node4	Items 58	Triggers 1	Graphs	Discovery 3	Web	192.168.7.216:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: logstash	Items 49	Triggers 1	Graphs	Discovery 3	Web	192.168.10.66:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: Oracle 19C	Items 49	Triggers 1	Graphs	Discovery 3	Web	192.168.10.67:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: Oracle 21C	Items 49	Triggers 1	Graphs	Discovery 3	Web	192.168.10.65:10050		VMware Guest	Enabled	ZBX	None		
Discover VMware VMs: vcenter	Items 161	Triggers 1	Graphs	Discovery 3	Web	192.168.3.15:10050		VMware Guest	Enabled	ZBX	None		

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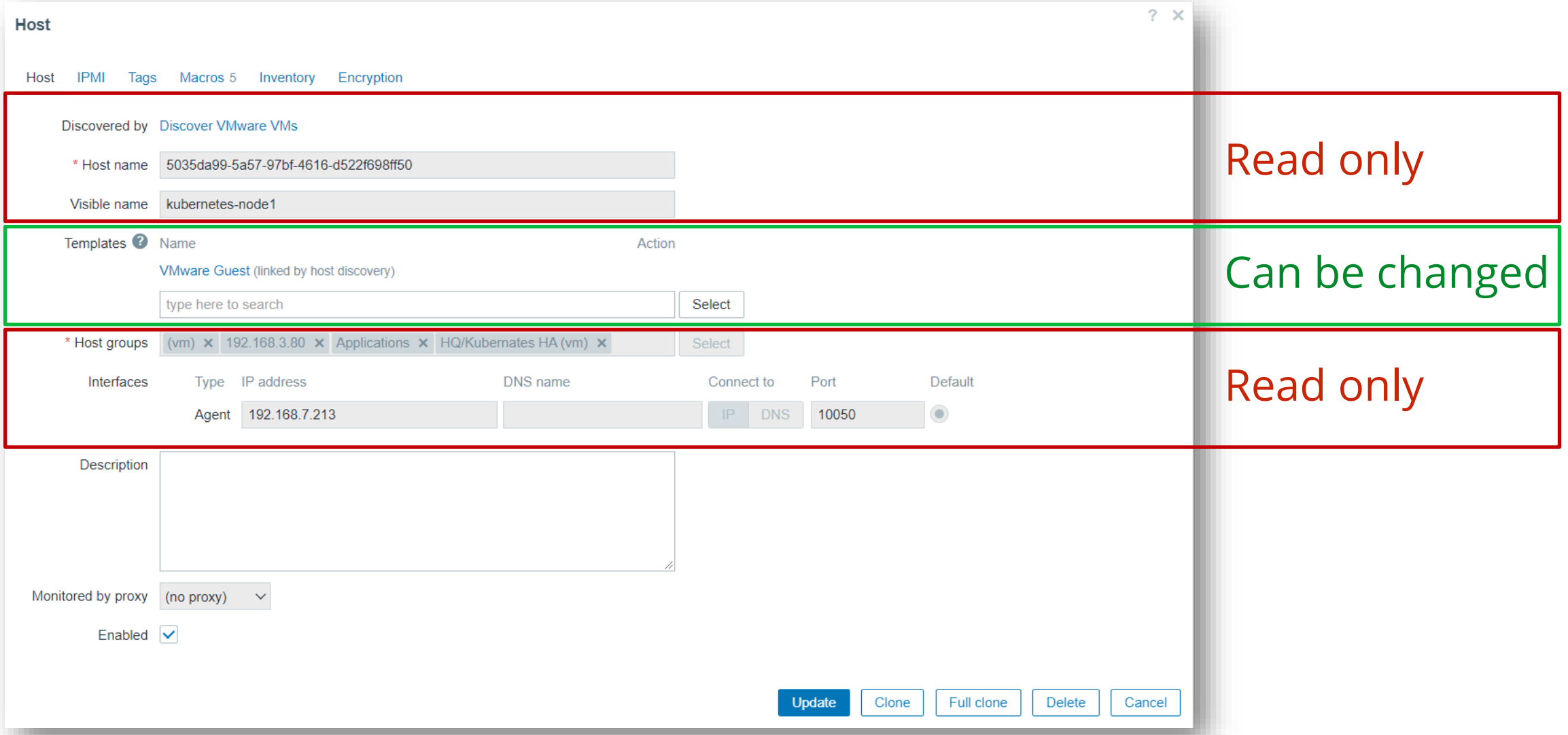
HOST EXAMPLE IN ZABBIX 6.2



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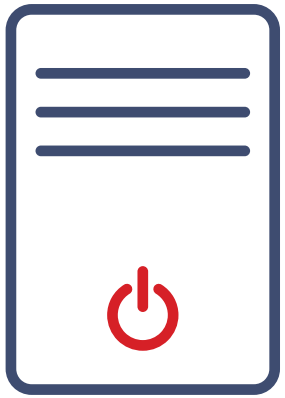
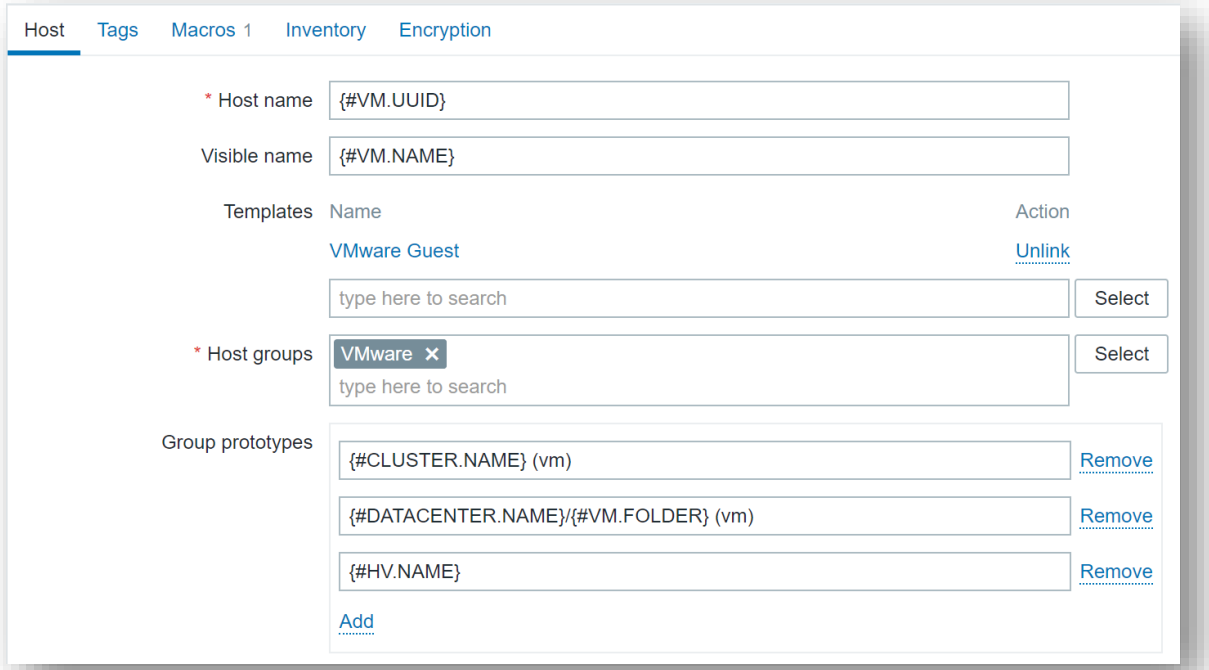
HOW HOST PROTOTYPES ARE DEFINED

HOST PROPERTIES

- Host prototypes are defined inside Low Level Discovery (LLD) rules
- Common host properties like name, host groups and linked templates are defined for all hosts which will be created from this prototype





WHAT IS LLD MACRO?

- LLD macros are values extracted from the discovery data

vmware.vm.discovery		
Performs virtual machine discovery.	{#VM.UUID}	Unique virtual machine identifier.
	{#VM.ID}	Virtual machine identifier (VirtualMachine managed object name).
	{#VM.NAME}	Virtual machine name.
	{#HV.NAME}	Hypervisor name.
	{#HV.UUID}	Unique hypervisor identifier.
	{#HV.ID}	Hypervisor identifier (HostSystem managed object name).
	{#CLUSTER.NAME}	Cluster name, might be empty.
	{#DATACENTER.NAME}	Datacenter name.
	{#DATASTORE.NAME}	Datastore name.
	{#DATASTORE.UUID}	Datastore identifier.
	{#VM.IP}	Virtual machine IP address, might be empty.
	{#VM.DNS}	Virtual machine DNS name, might be empty.
	{#VM.GUESTFAMILY}	Guest virtual machine OS family, might be empty.
	{#VM.GUESTFULLNAME}	Full guest virtual machine OS name, might be empty.
	{#VM.FOLDER}	The chain of virtual machine parent folders, can be used as value for nested groups; folder names are combined with "/". Might be empty.
	{#VM.TOOLS.STATUS}	VMware virtual machine tools state.
	{#VM.POWERSTATE}	VMware virtual machine power state (poweredOFF, poweredOn, or suspended).
	{#VM.RPOOL.ID}	Resource pool identifier.
	{#VM.RPOOL.PATH}	Full resource pool path excluding the "root" name "Resources". Folder names are combined with "/".
	{#VM.SNAPSHOT.COUNT}	Number of VM snapshots.

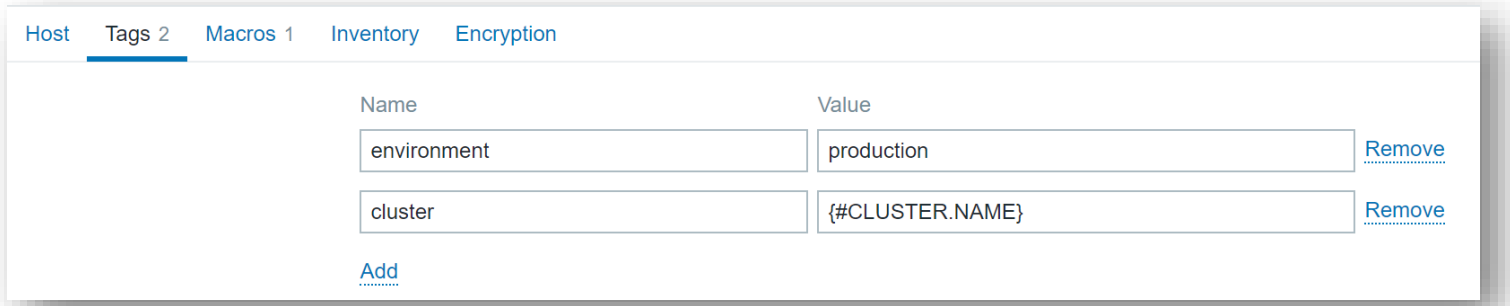
HOW LLD WORKS

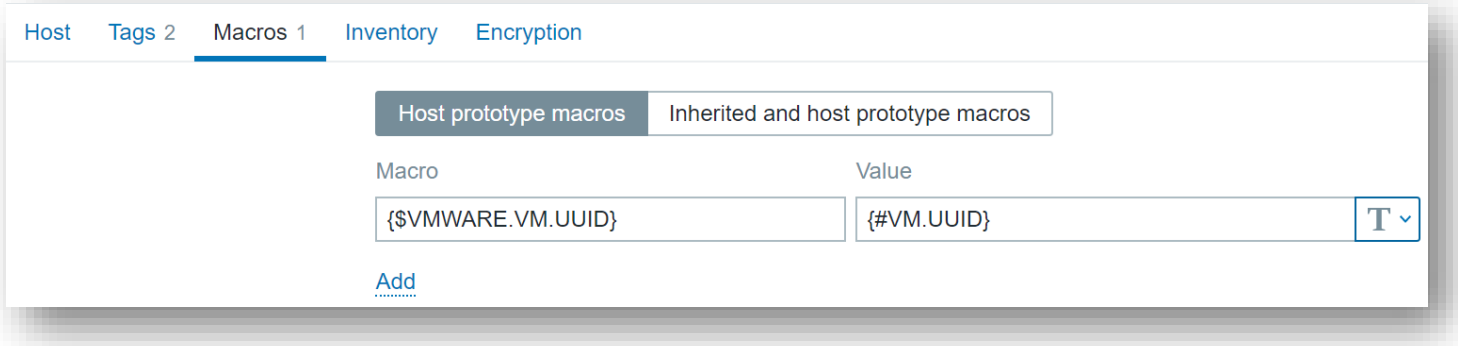
- LLD is based on structured data in JSON format


```
{
        "{#HV.UUID}": "32383138-3830-5a43-3337-3238434d3645",
        "{#HV.ID}": "host-603",
        "{#HV.NAME}": "192.168.3.80",
        "{#HV.IP}": "192.168.3.80",
        "{#DATACENTER.NAME}": "HQ",
        "{#CLUSTER.NAME}": "",
        "{#PARENT.NAME}": "HQ",
        "{#PARENT.TYPE}": "Datacenter",
        "{#HV.NETNAME}": "mysqldb.example.com"
},{
        "{#HV.UUID}": "34353935-3836-435a-4338-3336344c4b4c",
        "{#HV.ID}": "host-972",
        "{#HV.NAME}": "192.168.3.67",
        "{#HV.IP}": "192.168.3.67",
        "{#DATACENTER.NAME}": "HQ",
        "{#CLUSTER.NAME}": "",
        "{#PARENT.NAME}": "HQ",
        "{#PARENT.TYPE}": "Datacenter",
        "{#HV.NETNAME}": "centos.example.com"
}
```

ADDITIONAL HOST PROTOTYPE PROPERTIES

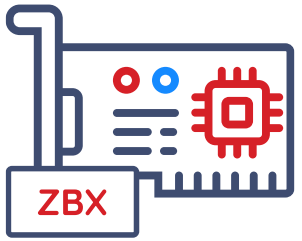
- Zabbix allows to define User macros (5.0) and Tags (5.2) for host prototypes
- Macro and tag values may contain LLD macros {#MACRO}

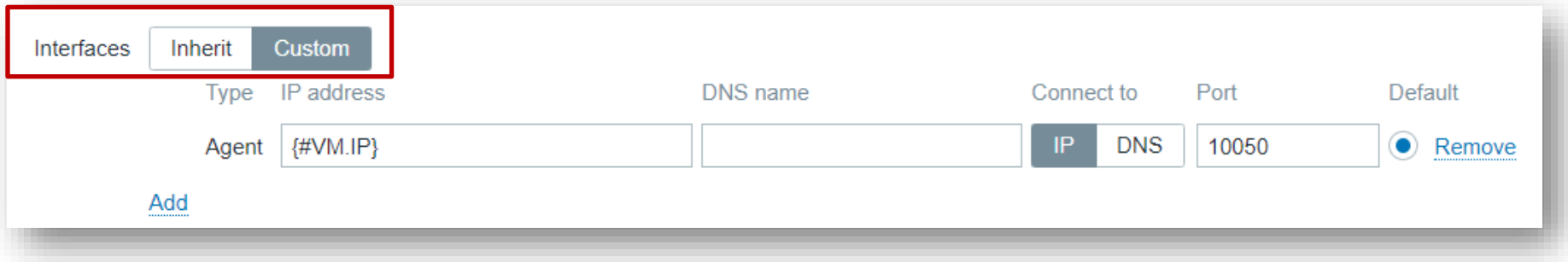




HOST INTERFACES

- Parent host interface was automatically inherited until Zabbix 5.2
- Now it is possible to choose custom interface using LLD macros
- Any interface type can be created (Agent, SNMP, JMX, IPMI)





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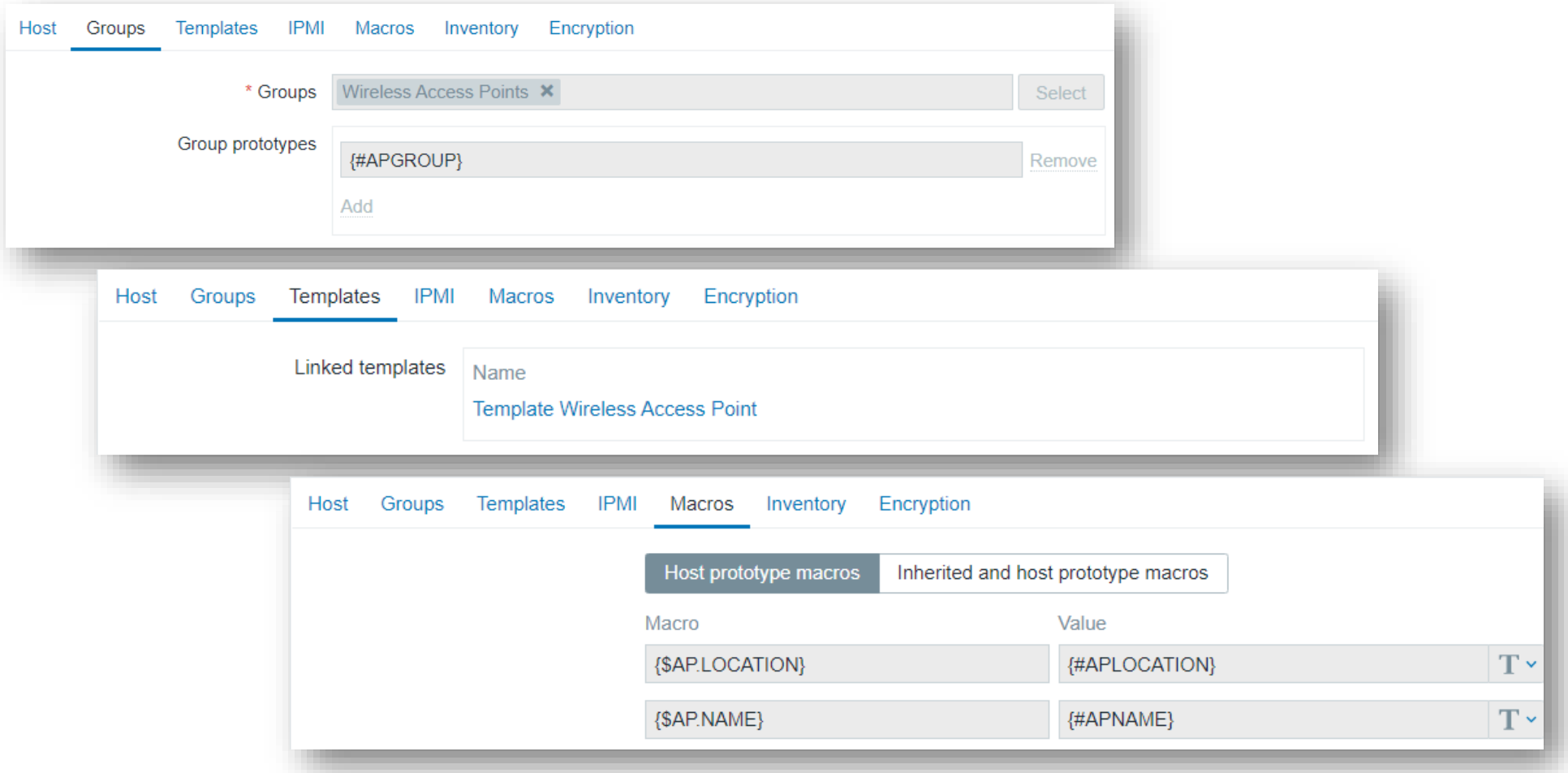
HOST PROTOTYPE IMPROVEMENTS IN 6.2

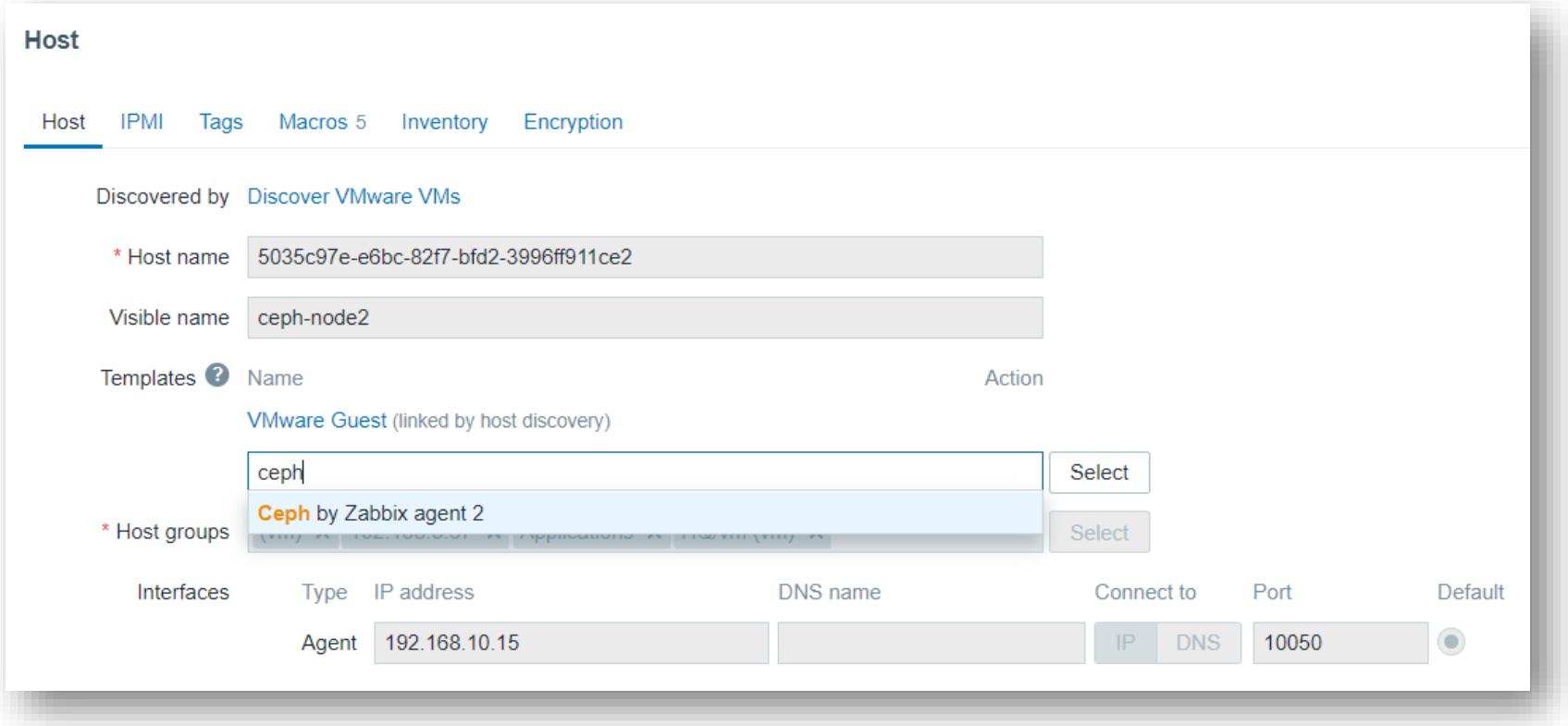
HOST PROPERTIES ON PREVIOUS ZABBIX VERSIONS

- Almost everything on the host created from prototype was read only until 6.2



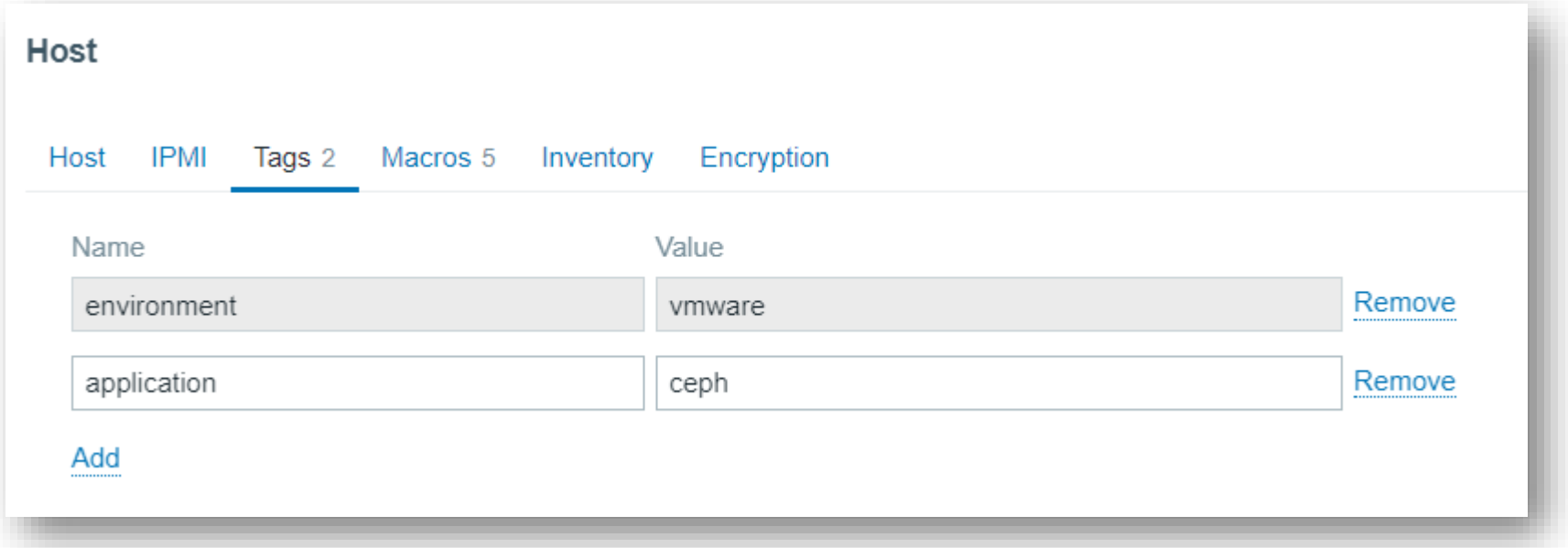
MANUALY LINK TEMPLATES

- It is possible to manually link templates to hosts created from prototypes
- The VMWare virtual machine has Zabbix agent 2 installed in this example



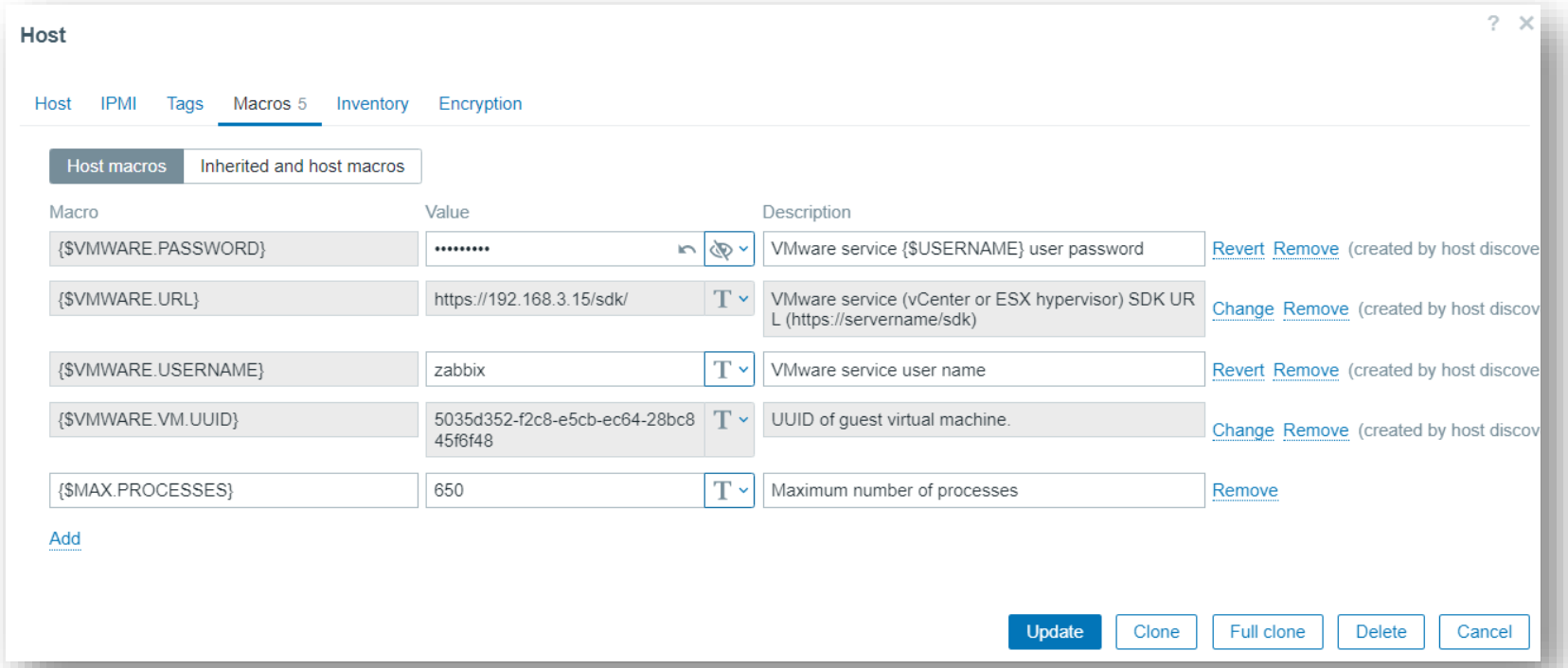
MANUALY ADD TAGS

- It is possible to manually assign tags to hosts created from prototypes
- The environment tag was created by LLD rule automatically
- application tag is added manually to the host later



MANUALY ADD OR CHANGE USER MACROS

- A value of existing user macro can be changed
- A new user macro can be added if necessary



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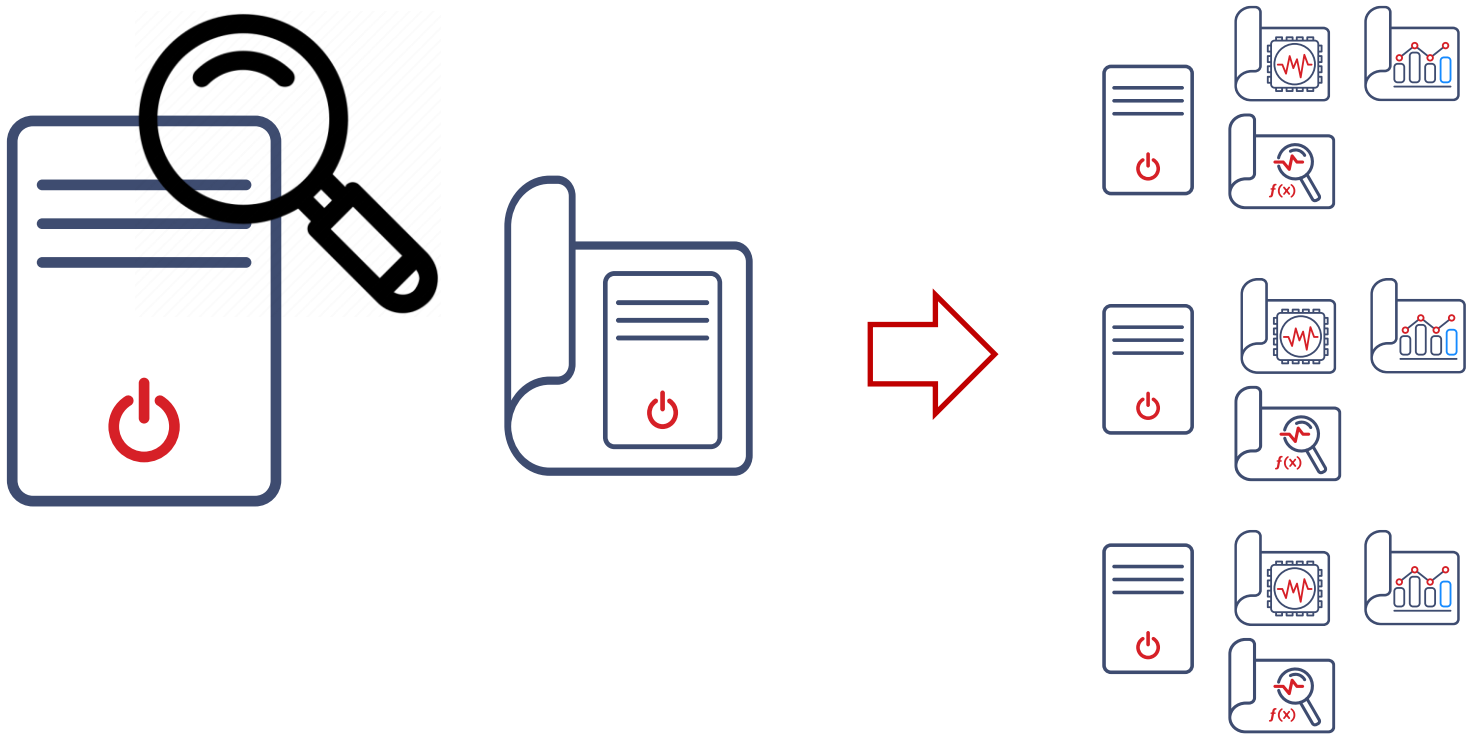
HOST PROTOTYPE USECASES

UNLEASH THE FULL POWER OF HOST PROTOTYPES

- Host prototypes may have their own LLD rules to discover metrics
- It is not possible to define host prototypes inside hosts created from prototypes

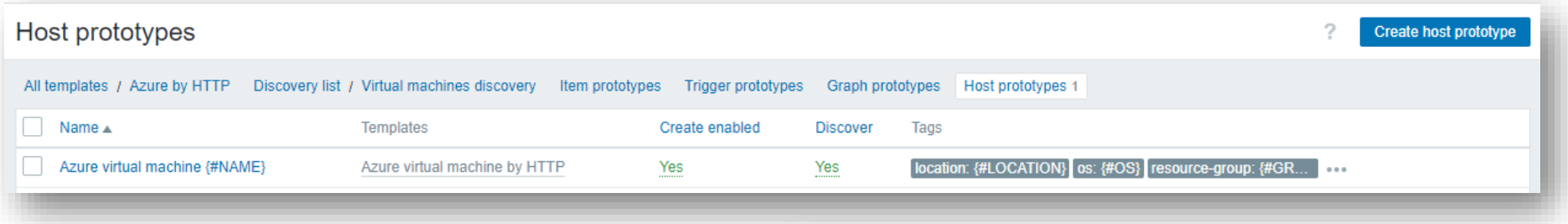


VMWARE MONITORING

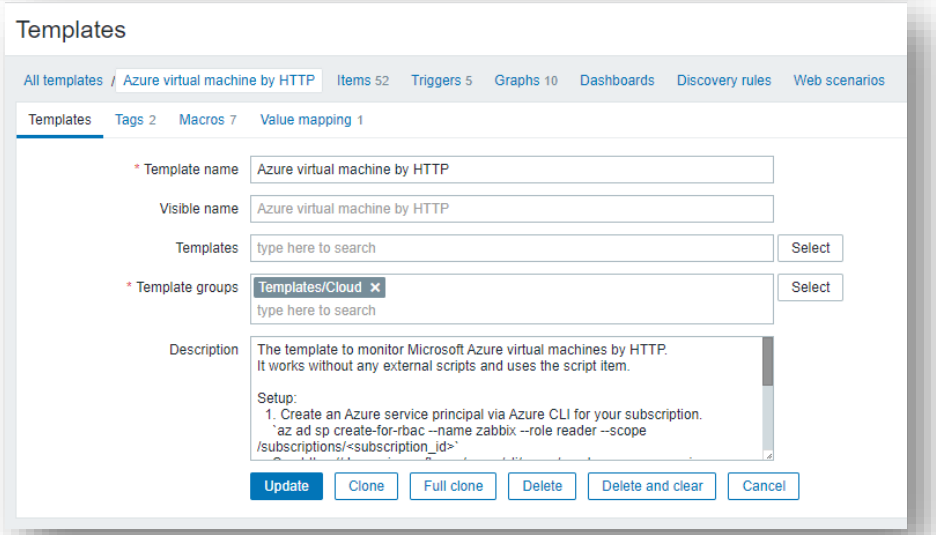
- Monitor VMware infrastructure using built-in templates
- Automatically discover all hypervisors and virtual machines
- Monitor most important virtual machines using Zabbix agents
- Manually link templates to monitor critical application
- Tune settings using custom tags and user macros

CLOUD MACHINES MONITORING

- Azure cloud provider is officially supported by Zabbix
- Use built-in template Azure by HTTP

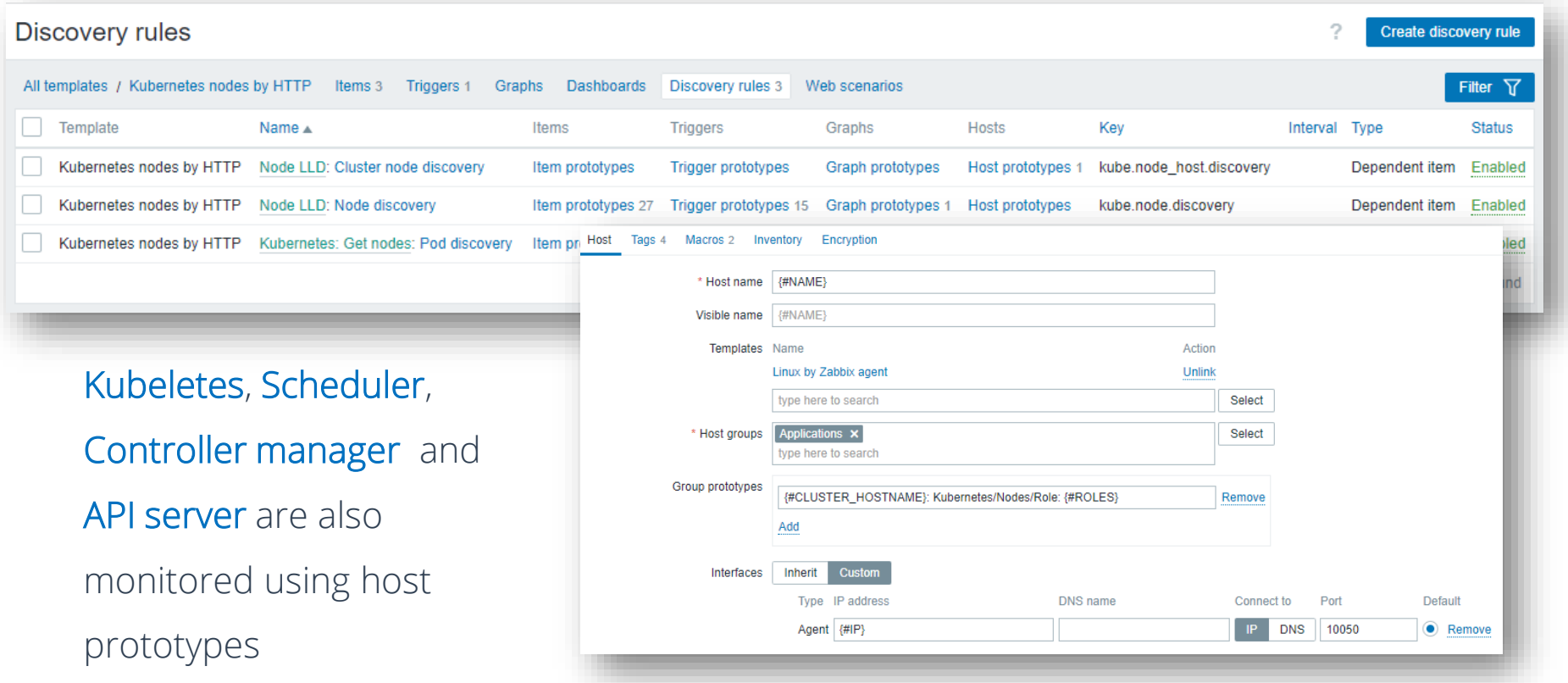


- Azure virtual machine by HTTP template will be automatically assigned to all hosts created from prototypes
- Link other templates if necessary



KUBERNETES MONITORING

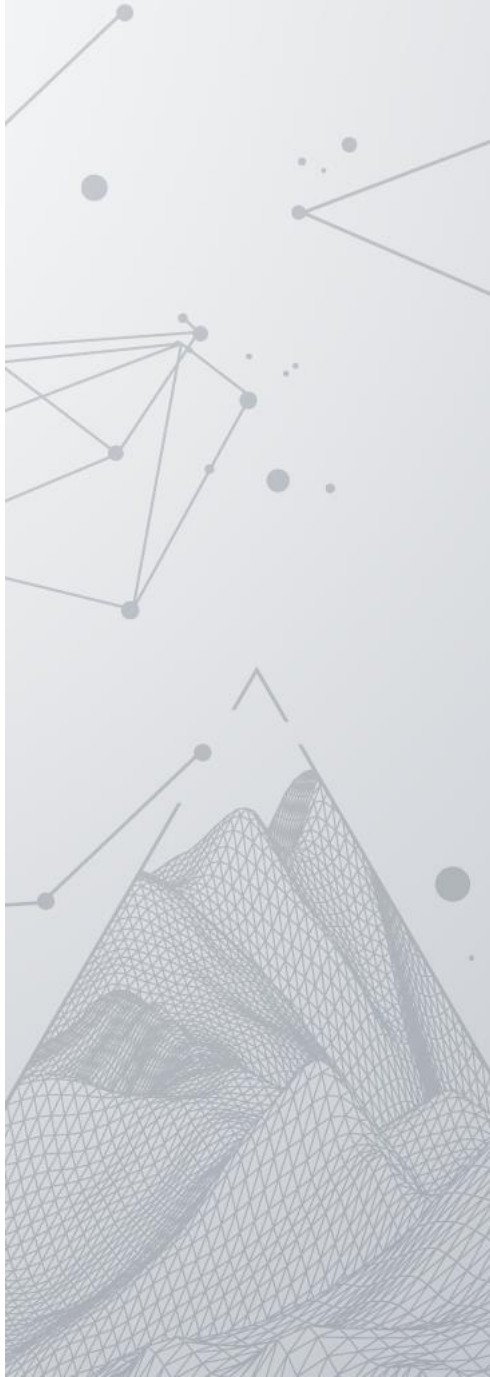
- All nodes are discovered by LLD rule
- Linux by Zabbix agent template is automatically assigned to all discovered hosts



- Kubeletes, Scheduler, Controller manager and API server are also monitored using host prototypes

USE HOST PROTOTYPES FOR OTHER PURPOSES

- Create hosts to logically group bulk data based on location or device by example
- 1000 hosts with 10 metrics can be easier to manage then one host with 10 000 items
- Access permissions can be assigned on host level
- Create dashboard for every host using templated dashboards
- Some use cases are HashiCorp consul nodes, wireless access points, databases, etc.



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HOST PROTOTYPES WORKSHOP

ATTEND THE HOST PROTOTYPES WORKSHOP

- Workshop will be provided on Saturday 08:30-09:45
- Zabbix virtual machines will be provided by us
- An example scenario will show how to create hosts using host prototypes

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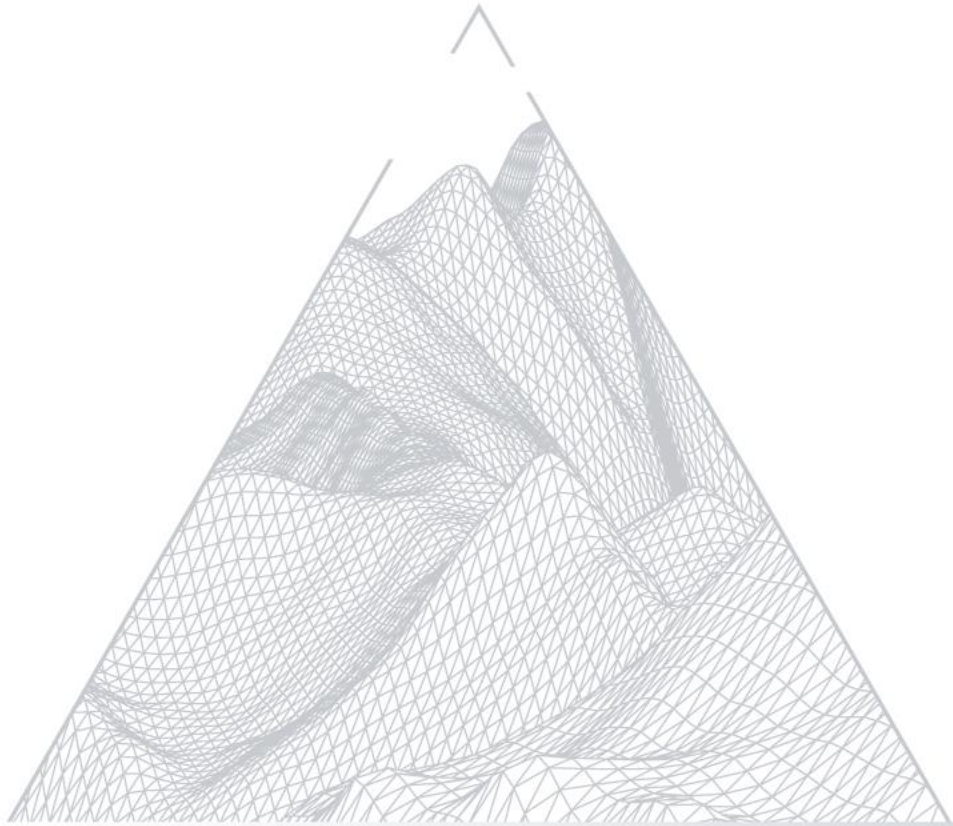

THANK YOU!