ITA_User Instruction Manual

Host group Function

―Version1.3 ―

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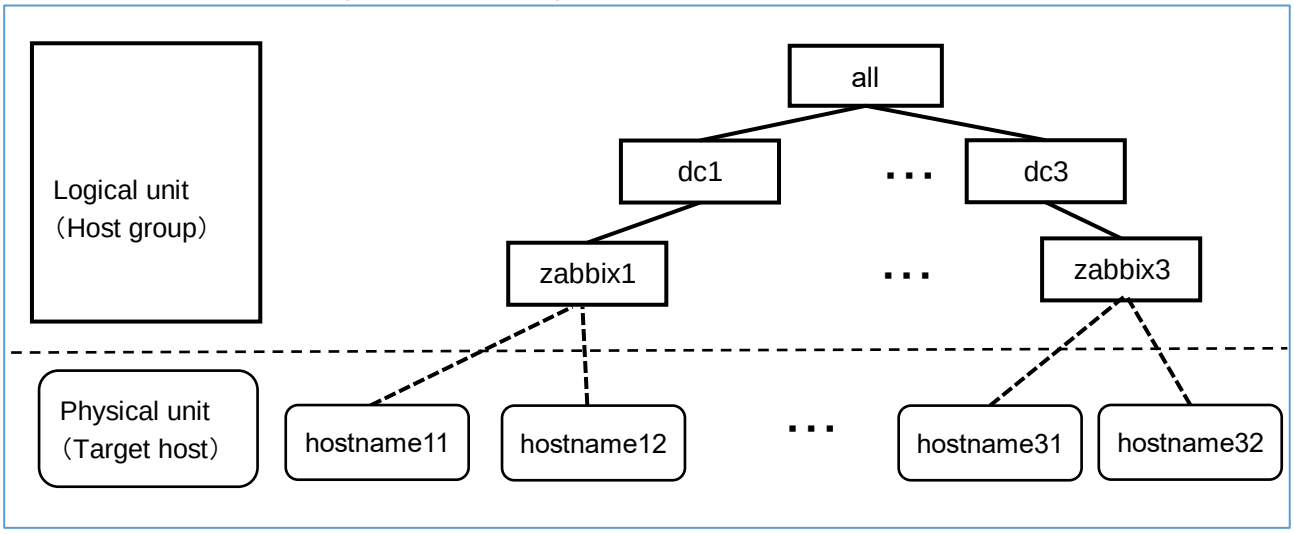
Introduction

This document describes the functions and operation methods of the ITA host group function (hereinafter referred as Host group) system.

1 Overview and Advantages of host groups

Overview of Host groups

A host group is a group of hosts organized in logical units (Functions/Roles)
The conceptual diagram of the host group is as follows.



The above figure consists of the following elements.

■Host group

Described in the square with a single line frame in given figure dc1、dc3、zabbix1、zabbix3 all are applicable and stated above.

■Target host

Host indicating physical device.

Described as a round square corner in the given figure. Hostname11, hostname12, hostname31, hostname32 are applicable and stated above

The upper host group is called the parent host group, and the lower host group is called the child host group, and they have a parent-child relationship. The lower end host group is associated with target host. In above example the child host group is viewed from dc1 is zabbix1 and the parent host group is viewed from zabbix1 is dc1

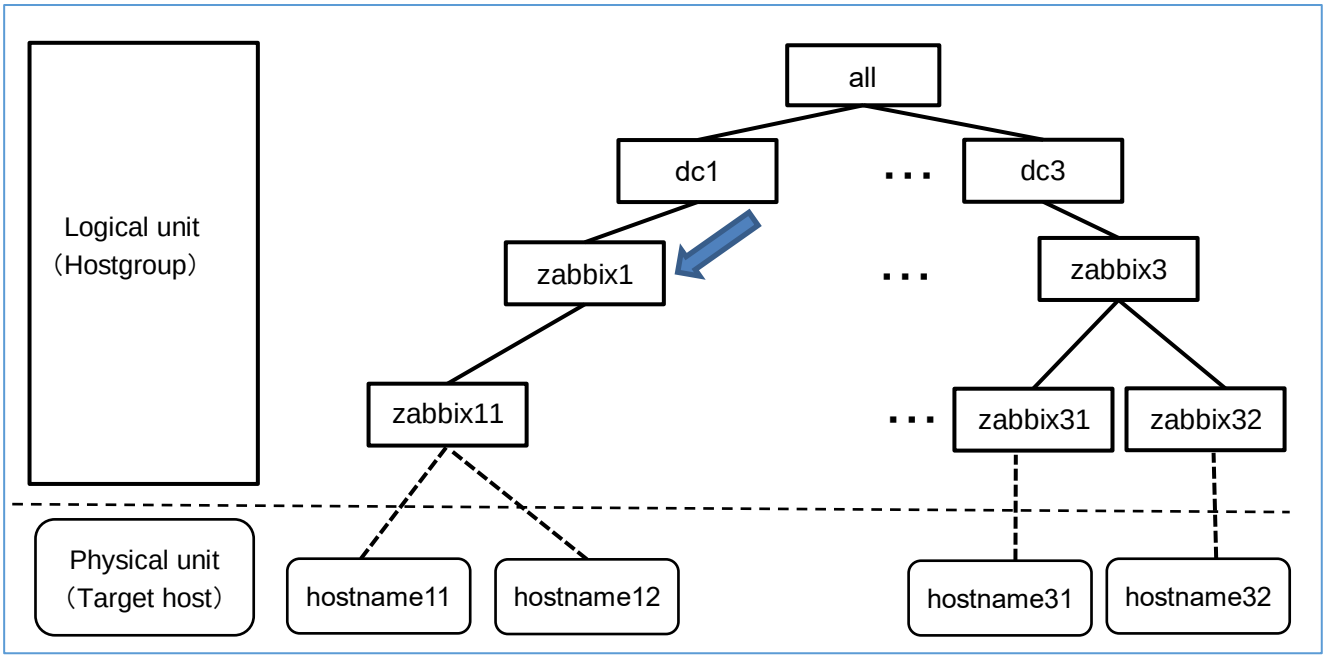
A hierarchy can be defined as count 1 host group as 1 level, Count a pair of parent and child as 2 levels. Up to 15 hierarchies can be defined from the host group at the top to the host group at the end. In the example from the above figure, if we go from “all” to “zabbix1”, we get 3 hierarchies.

Advantages of host groups

1.1.1 Inheritance of parameters between host groups

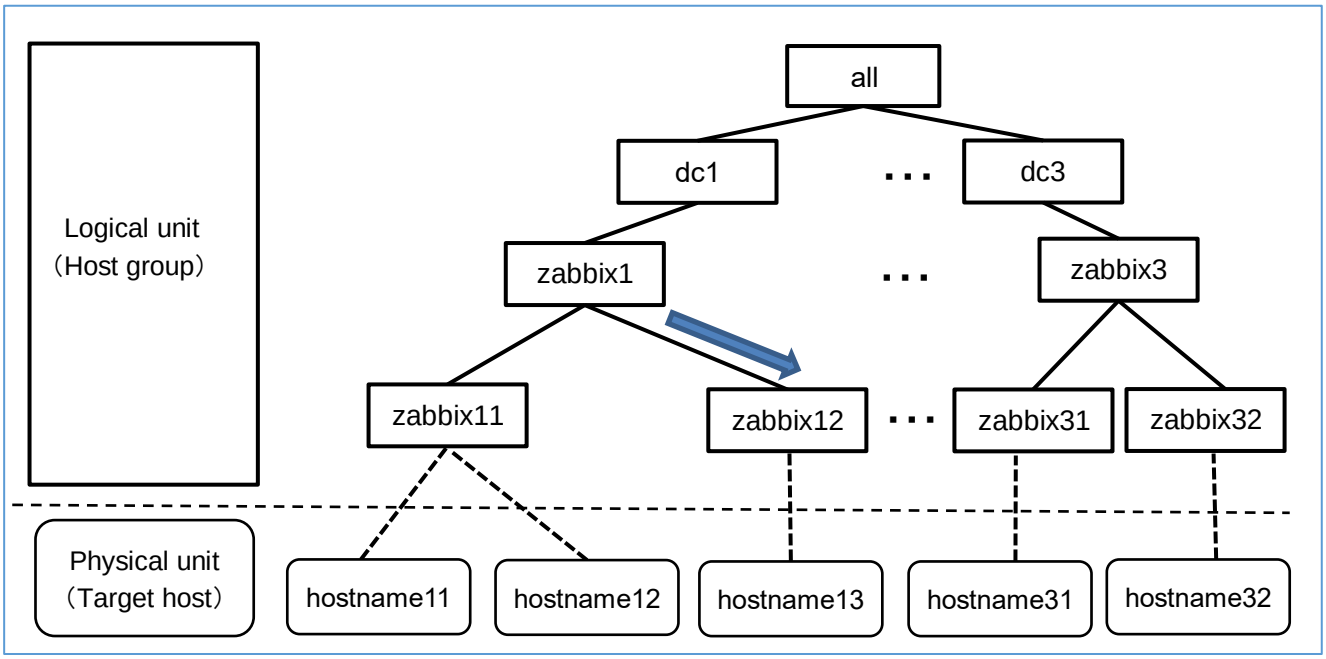
Parameters set in parent host group are inherited by child host group.

In the given example below, the parameters set for dc1 (for example, user password) are inherited to zabbix1.However, if there is no specific value, it is not inherited.

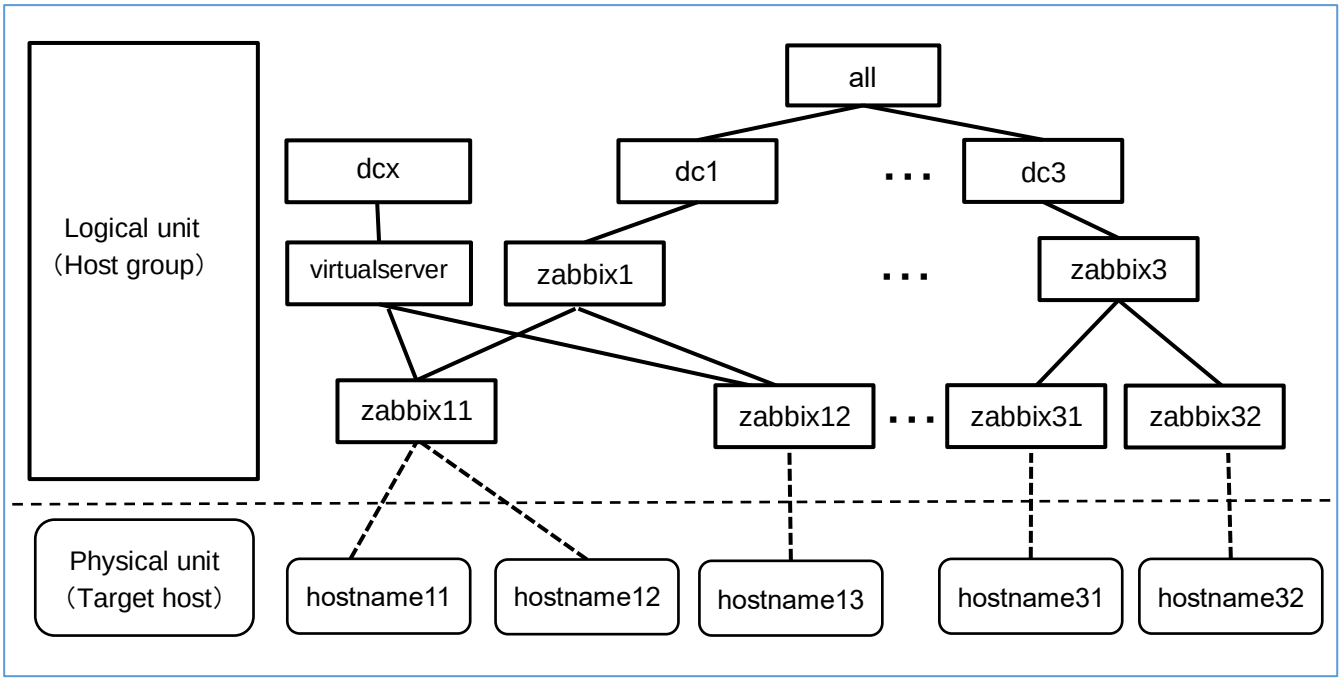


By localizing the settings in this way, assignment/change of settings can be simplified.

The parameter settings are automatically inherited even when a child host group is added. In the example below, when one zabbix server is added, zabbix12 is linked to zabbix1.As a result, the settings of zabbix1 are inherited by zabbix12 in the same way follows to zabbix11.



A child host group can be linked to multiple parent host groups. Here explains the inheritance of parameters when there are multiple parent host groups. In the example below, zabbix11 and zabbix12 belongs to zabbix1 and virtual server.



If parameters are overlap between the host groups, they are applied from the lowest host group. In the above example, if the same parameters are set for dcx and zabbix1, the parameters inherited by zabbix11 and zabbix12 are not dcx but lower zabbix1 parameters.

If the parameters overlap in the same hierarchy, they are inherited from the parent host group with higher priority. In the above example, if the same parameters are set for virtual server and zabbix1, if the priority of virtual server is1 and if the priority of zabbix1 is 2, then the priority of zabbix1 is higher, so the parameter of zabbix1 is inherited by child host group.
How to set the priority is described in 「4.2 Register host group」

2. Main features of the host group function

The main features of the host group function are classified into the following categories.

① Web

Web content。A screen that allows to use the host group function provided by the browser.

② BackYard

A resident process that runs on a server independently of Web content.

3. Menu group of host group function

The menu groups of the host group function and the menus belonging to them are as follows.

Menu group	Affiliated menu	Section	Description
Hostgroup management console	Hostgroup Management	4.2	Register host group
	Hostgroup parent-child link list	4.3	Define the parent-child relationship of host group
	Host link list	4.4	Associate host group with operation and target hosts
	Create Hostgroup Variable link list	5.2	Register host group variables
	Hostgroup variable link list	5.3	Register specific values for host group variables

3.1 About the「Host Group Management Console」menu group

Host group management, host group parent-child link list, host link list are the menu required to register host groups and define which operation is to be performed on which host. Details of the operation are described in「4 Set information for each host」.

Create Host group variable list and host group variable linking are menus required to convert Host group variables and register specific values. Details of the operation are explained in 「5 Host Group Variables」.

4. Set information for each host

The following table shows the workflow for registering host groups and setting information for each host using Web content.
Details of the work are described in each section.

Section	Contents of work	User operation	Menu group used	Menu used	Remarks
4.1	Create parameter sheet	Yes	Create parameter list menu	Menu creation information Menu item creation information Execute menu creation Menu creation management	—
4.2	Register host group	Yes	Host group management	Host group management	—
4.3	Define a parent-child relationship of host group-	Yes	Host group management	Host group parent child link list	—
4.4	Associate host group with operation and target hosts	Yes	Host group management	Host link list	—
4.5	Register parameter sheet menu	Yes	※2	Menu created in 「4.1Create parameter sheet」	—
4.6	Hosting	No ※1	※2	Menu created in 「4.1Create parameter sheet」	Manual registration/Update unavailable
4.7	Associate operation with setting value of the item in each target host	Yes	※2	Substitute value automatic registration setting	Refer to「Parameter Management Menu Guide」for substitution value automatic registration setting.
4.8	Reflect operation to the associated target host	No ※1	※3	Target host	Refer to「Parameter Management Menu Guide」for substitution value automatic registration setting.
4.9	Reflect substitution values	No ※1	※3	Substitution value list	Refer to「Parameter Management Menu Guide」for substitution value automatic registration setting.

※1
No user operation is required because it is executed by internal processing. Processing results can be checked on the menu screen.

※2
Menu group specified in「4.1 Create parameter sheet」.

※3
Menu group that performs substitution value automatic registration.

After each operation, the image of the record will be as shown in the table below.

<table>
<tr><th>Section</th><th>Contents of work</th><th>Image of record</th></tr>
<tr><td>4.2</td><td>Register host group</td><td>
<table>
<tr><th>Host group</th></tr>
<tr><td>HG_1</td></tr>
<tr><td>HG_2</td></tr>
<tr><td>hg_1a</td></tr>
<tr><td>hg_1b</td></tr>
<tr><td>hg_2a</td></tr>
<tr><td>hg_2b</td></tr>
</table>
</td></tr>
<tr><td>4.3</td><td>Define parent-child relationship of host group</td><td>
<table>
<tr><th>Parent host group</th><th>Child host group</th></tr>
<tr><td>HG_1</td><td>hg_1a</td></tr>
<tr><td>HG_1</td><td>hg_1b</td></tr>
<tr><td>HG_2</td><td>hg_2a</td></tr>
<tr><td>HG_2</td><td>hg_2b</td></tr>
</table>
</td></tr>
<tr><td>4.4</td><td>Associate host group with operation and target hosts</td><td>
<table>
<tr><th>host group</th><th>Operation</th><th>target host</th></tr>
<tr><td>hg_1a</td><td>2017/10/31_1001_OP1</td><td>host_1a</td></tr>
<tr><td>hg_1b</td><td>2017/10/31_1001_OP1</td><td>host_1b</td></tr>
<tr><td>hg_2a</td><td>2017/10/31_1001_OP1</td><td>host_2a</td></tr>
<tr><td>hg_2b</td><td>2017/10/31_1001_OP1</td><td>host_2b</td></tr>
</table>
</td></tr>
<tr><td>4.5</td><td>Register parameter sheet menu</td><td>
<table>
<tr><th>target host or Host group</th><th>Operation</th><th>Item 1</th><th>Item 2</th></tr>
<tr><td>HG_1</td><td>2017/10/31_1001_OP1</td><td>111</td><td>AAA</td></tr>
<tr><td>HG_2</td><td>2017/10/31_1001_OP1</td><td>—</td><td>BBB</td></tr>
</table>
</td></tr>
<tr><td>4.6</td><td>Hosting</td><td>
<table>
<tr><th rowspan="2">Target host</th><th colspan="3">Operation</th><th rowspan="2">Item1</th><th rowspan="2">Item 2</th></tr>
<tr><th>Scheduled execution date</th><th>ID</th><th>Operation</th></tr>
<tr><td>host_1a</td><td>2017/10/31</td><td>1001</td><td>OP1</td><td>111</td><td>AAA</td></tr>
<tr><td>host_1b</td><td>2017/10/31</td><td>1001</td><td>OP1</td><td>111</td><td>AAA</td></tr>
<tr><td>host_2a</td><td>2017/10/31</td><td>1001</td><td>OP1</td><td>—</td><td>BBB</td></tr>
<tr><td>host_2b</td><td>2017/10/31</td><td>1001</td><td>OP1</td><td>—</td><td>BBB</td></tr>
</table>
</td></tr>
</table>

4.7	Associate operation with setting value of the item in each target host	

Menu group name:Menu name	Item	Movement	Variable name
Parameter management (hosting): Created menu name	Item 1	Movement1	VAR_variable1
Parameter management (hosting): Created menu name	Item 2	Movement2	VAR_variable2

Section	Contents of work	Image of record
4.8	Reflect operation to the associated target host.	

Operation	Movement	Target host
1001_OP1	Movement1	host_1a
1001_OP1	Movement1	host_1b
1001_OP1	Movement2	host_1a
1001_OP1	Movement2	host_1b
1001_OP1	Movement2	host_2a
1001_OP1	Movement2	host_2b

4.9	Reflect substitution values	

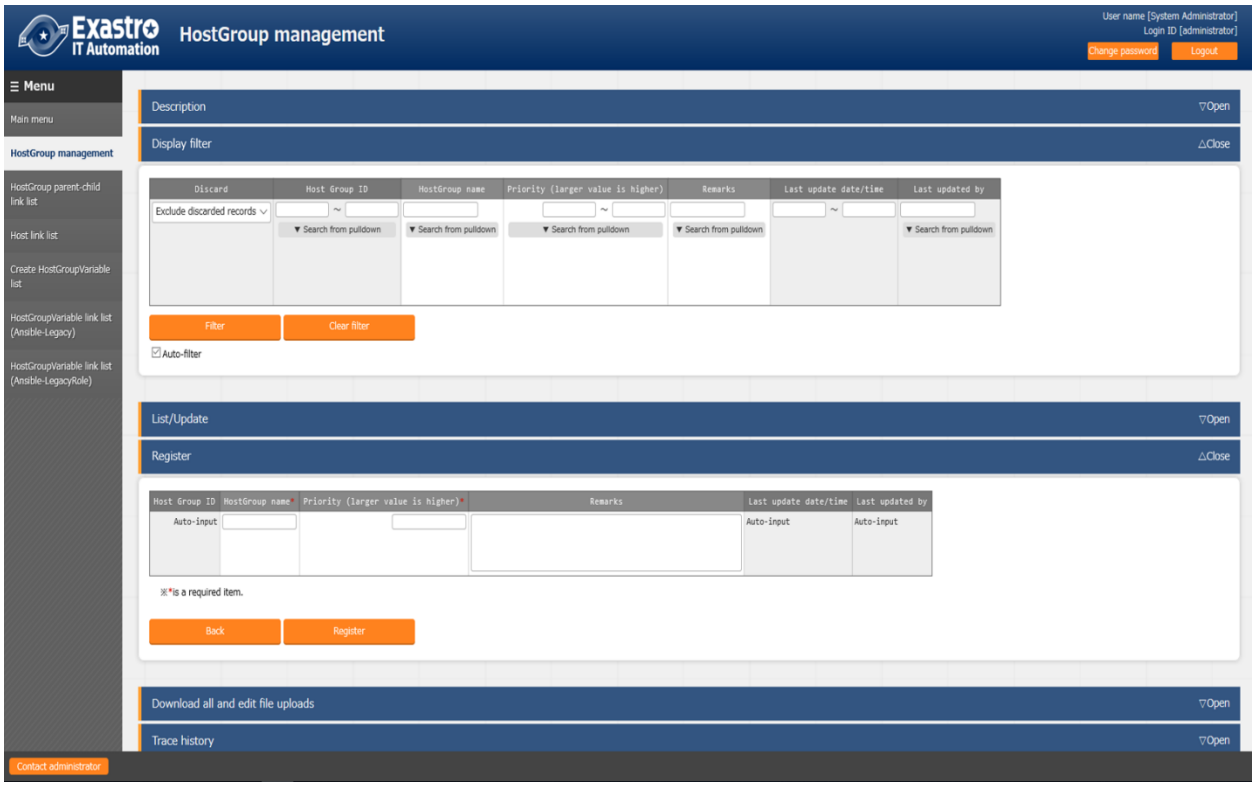
Operation	Movement	Target host	Variable name	Specific value
1001_OP1	Movement1	host_1a	VAR_variable1	111
1001_OP1	Movement1	host_1b	VAR_variable1	111
1001_OP1	Movement2	host_1a	VAR_variable2	AAA
1001_OP1	Movement2	host_1b	VAR_variable2	AAA
1001_OP1	Movement2	host_2a	VAR_variable2	BBB
1001_OP1	Movement2	host_2b	VAR_variable2	BBB

4.1 Create parameter sheet

Create parameter sheet menu using the parameter list creation information.
For the details of the parameter sheet creation function, please refer to 「User instruction manual_Parameter Sheet Creation Function.」

4.2 Register host group

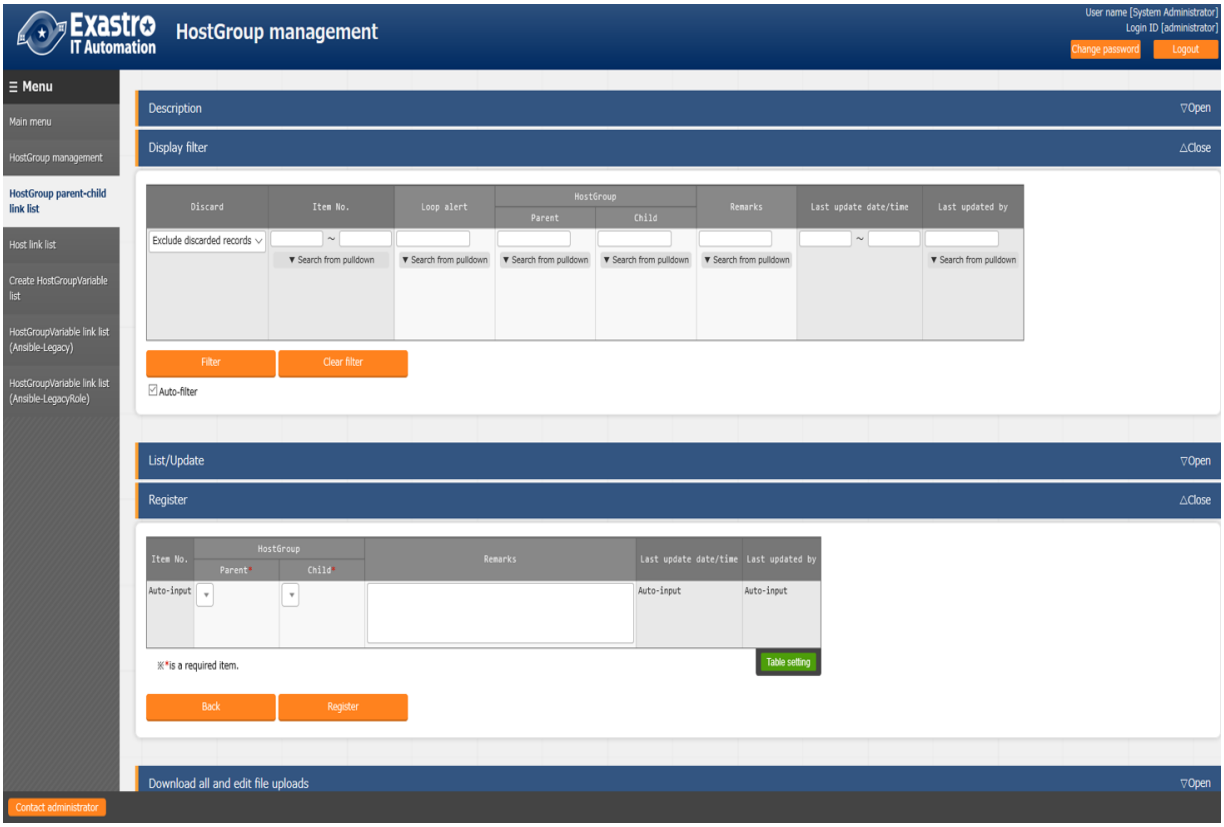
Register host group using the host group management menu.



Column name	Description
Host group name	Enter the name of the host group
Priority (larger value is higher)	Enter the priority. The input range is from 1 to 2,147,483,647

4.3 Define the parent-child relationship of host group

Use the Host group parent-child link list menu to define the parent-child relationship of the host group.



Column name		Description
Host group	Parent	Select the parent host group name
	Child	Select the child host group name associate with the parent host group

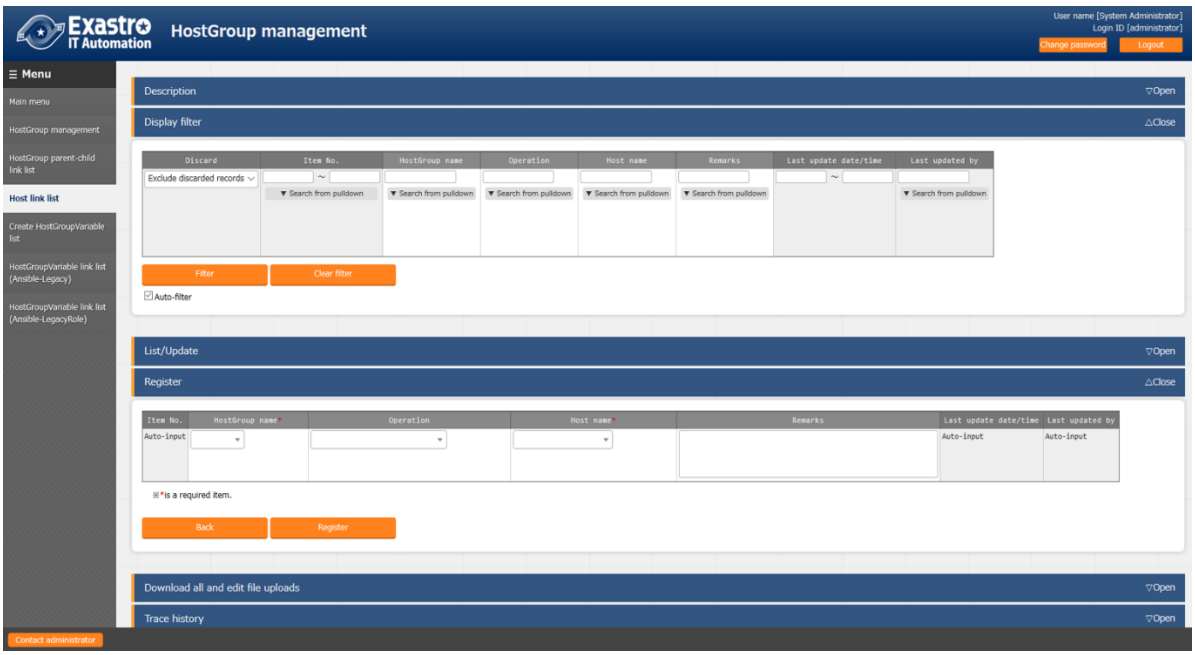
If there is host group that has parent-child loop, which is「●」displayed in the Loop alert column Of the display results of display filter

In the example below. Although the parent-child relationship between zabbix1 (parent) and zabbix11 (child) has already been defined, it also defines the reverse parent-child relationship of zabbix11 parent) and zabbix1 (child), and the parent-child relationship is a loop. Please make sure not to create a loop because if there is a loop already, the internal processing is described below「Host group decomposition function」,「Host group variable conversion function」, and「Host group variable registration function」will not execute.

Update	Discard	Item No.	Loop alert	HostGroup		Remarks	Last update date/time	Last updated by
				Parent	Child			
Update	Discard	1	•	new-host	new-hg	parent-child	2020/02/18 13:59:30	System Administrator
Update	Discard	2		new-host	new-test	new	2020/02/18 14:03:17	System Administrator
Update	Discard	3	•	new-hg	new-host	reverse	2020/02/18 14:04:53	System Administrator

4.4 Associating a host group with an operation and target hosts

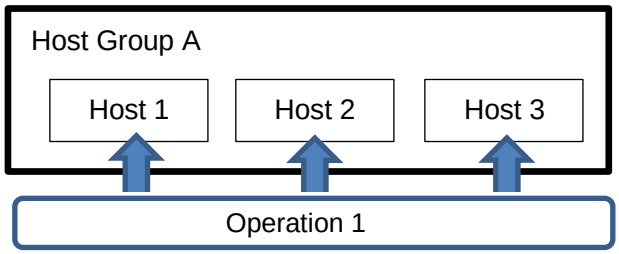
Use the host link list menu to register the target host to be associated with the host group and operation.



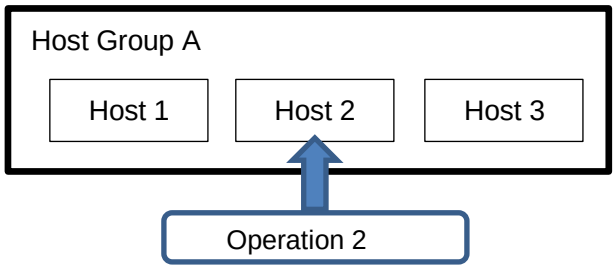
Column name	Description
Host group name	Select a host group.
Operation	Select a operation.※1
Host name	Select a target host.

By associating the host group and operation with the target host, you can select the target host in the host group as shown in the figure below.

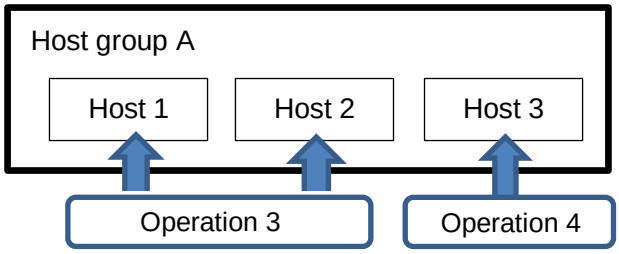
Example 1
When all hosts belonging to a host group are to be set as operation target host



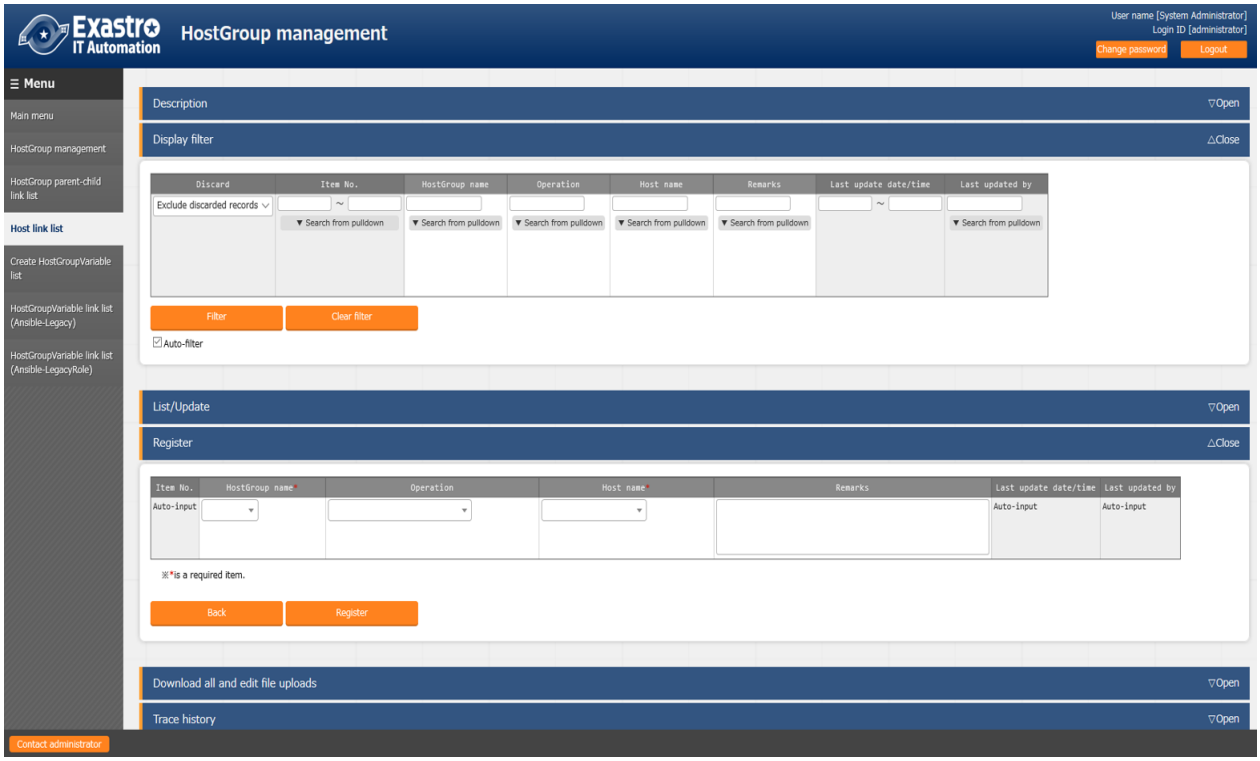
Example 2
When some hosts are to be set as operation target host

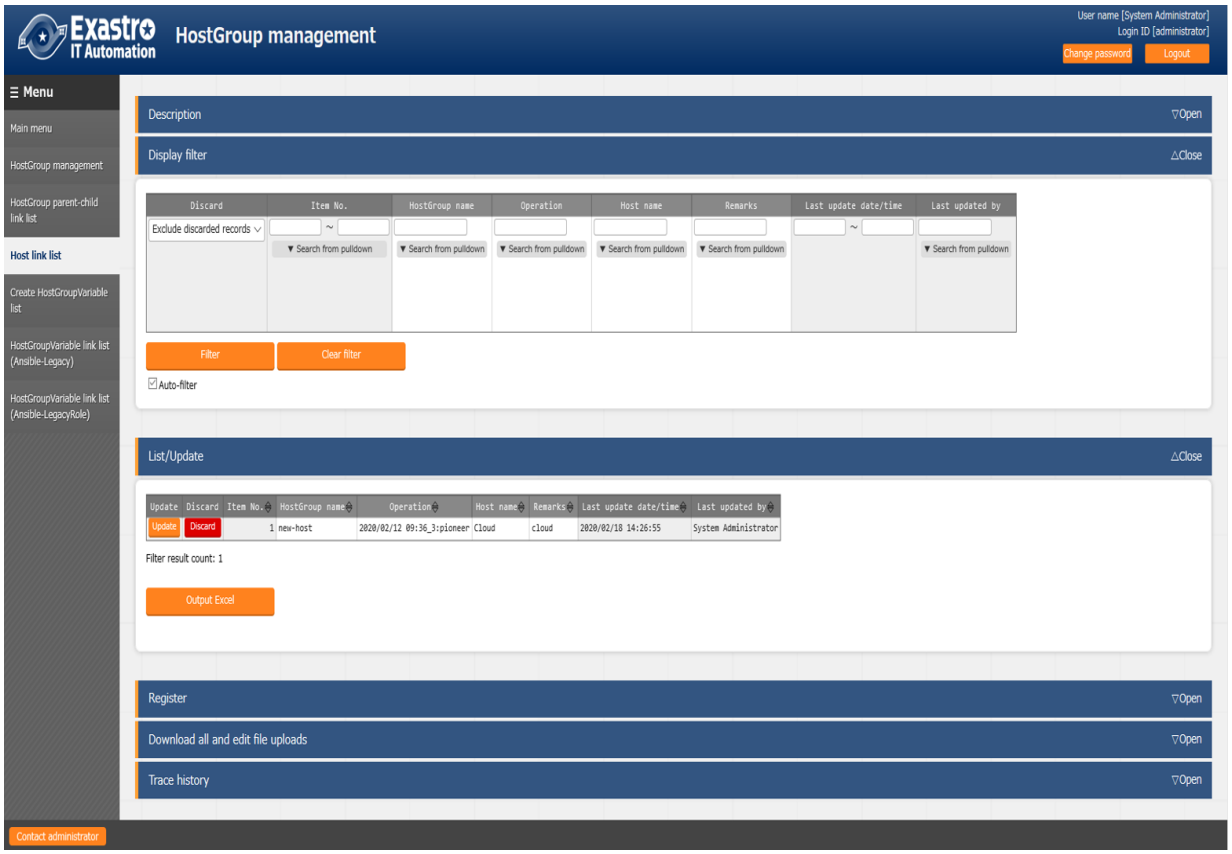


Example 3
Combination of patterns in Example 2



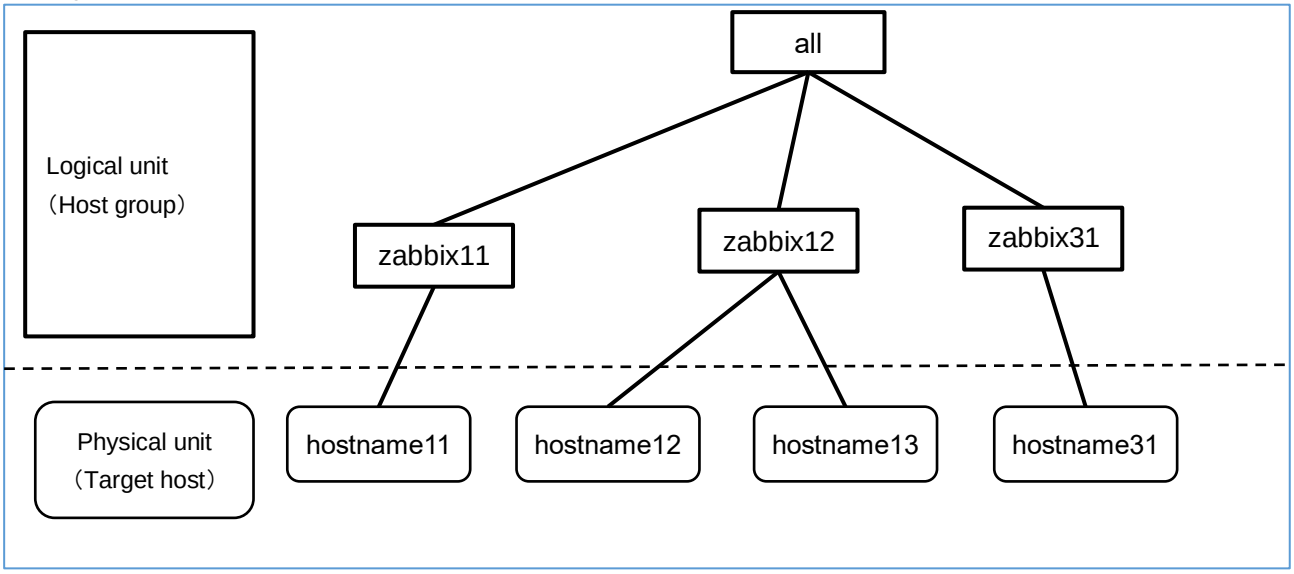
※1
In the host link list menu, the operation can also be registered as NULL. In case if NULL is registered, association will be enabled for all operations.



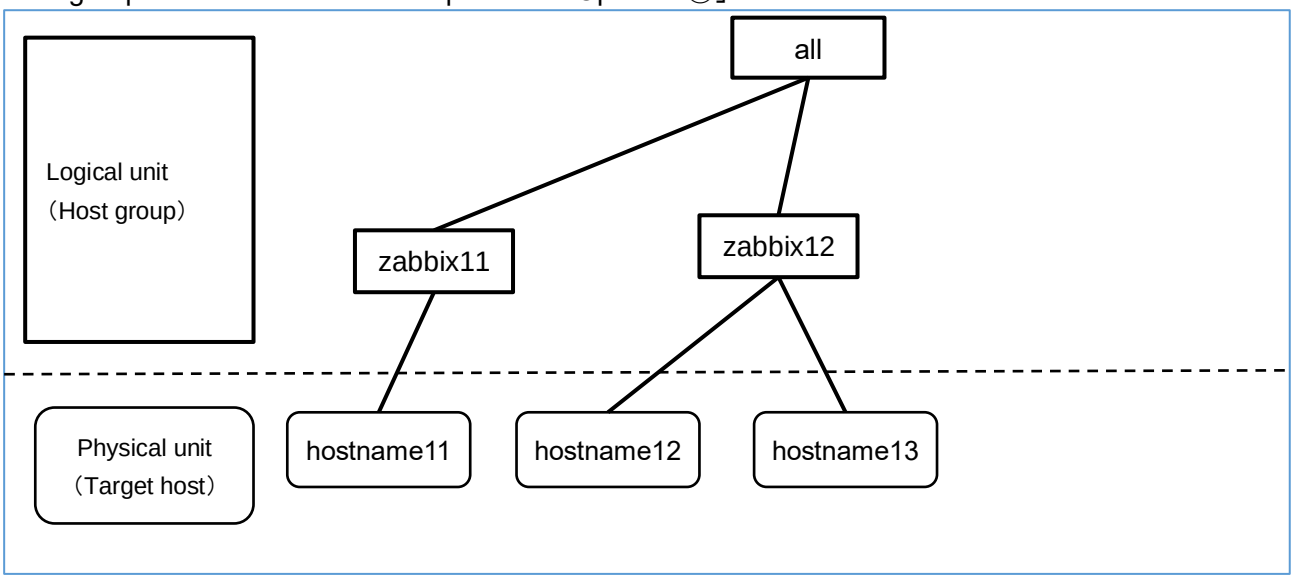


In the above example, the association of host groups zabbix1 and zabbix2 where the operation is registered as NULL which is valid for all operations. On the other hand, the host group zabbix3 for which the operation has been registered is valid only for the registered operation for「Operator①」.

Host group association in operation「Operator①」

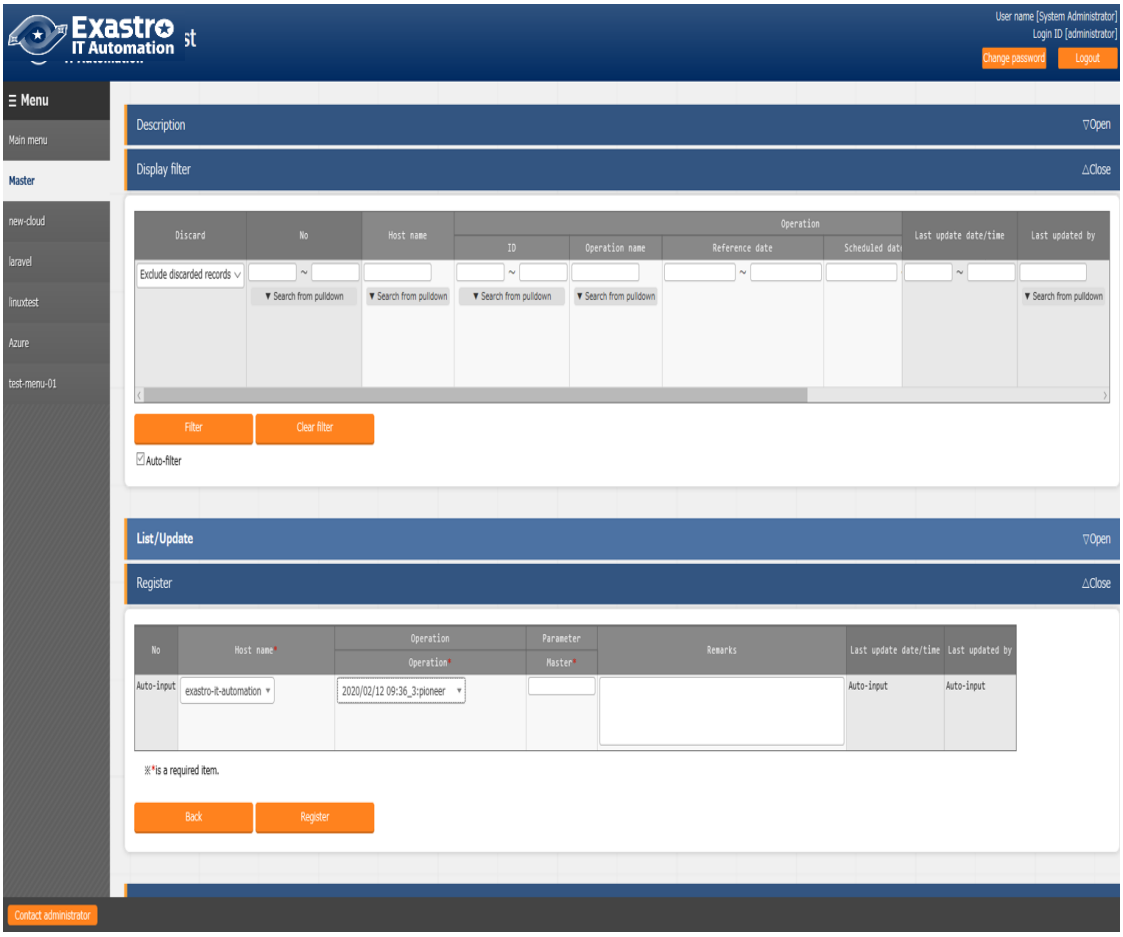


Host group association other than operation 「Operator①」



4.5 Register parameter sheet menu

In the parameter sheet menu for the host group created in「4.1 Create Parameter Sheet」,the specific value for each operation is registered in the item with the target host or host group. After registration, users can View/Update/Discard/Restore the registration.

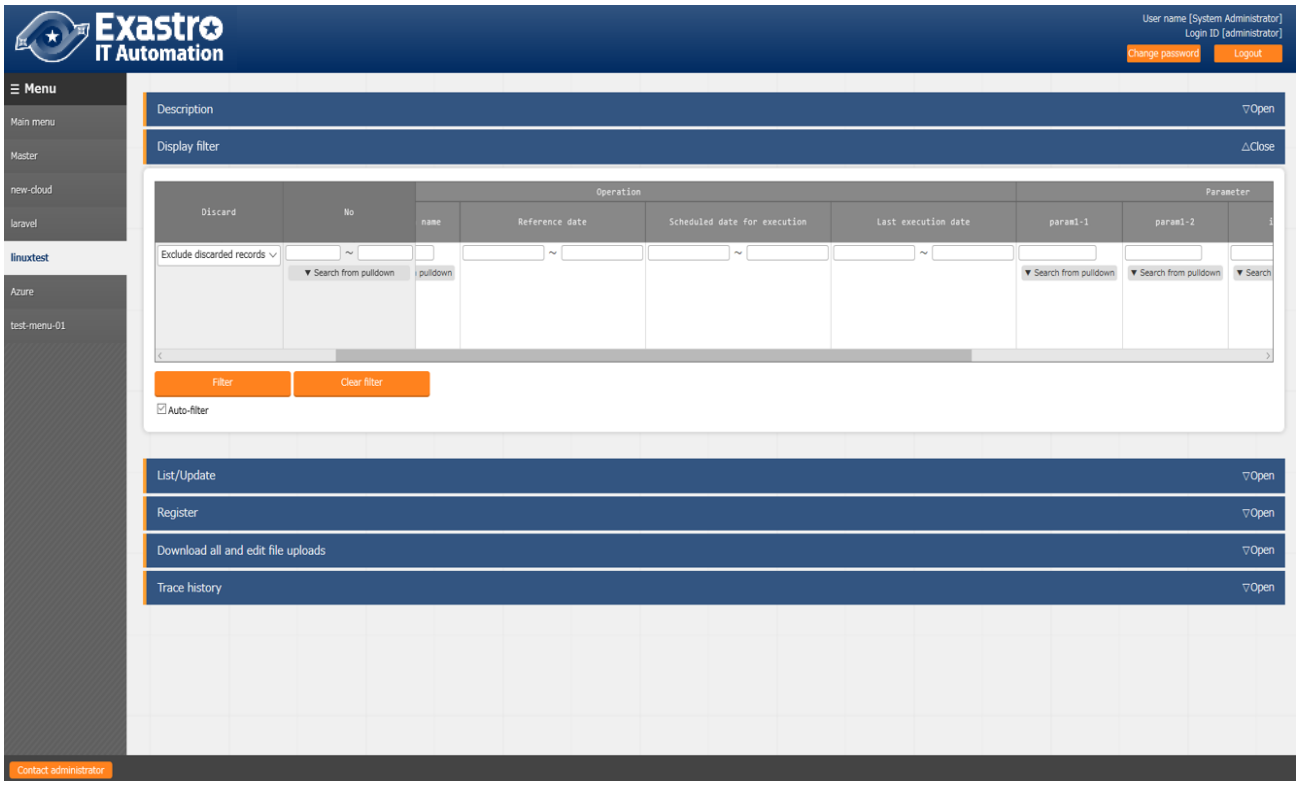


Column name	Description
Host name/Host group name	Select the target host or host group. The prefix [H] is the target host and [HG] is the host group.
Operation	Select an operation.
Item name (Item name defined in「4.1 Parameter Sheet Creation」)	Enter the specific value of the item. The specific values entered are reflected as the specific value for the operations and the variables associated with Movement and the target host in the「4.9 Reflection of the substitution value」

The combination of「Host name/Host group」and「Operation」is registered uniquely. The same host can be registered if combined with different operations.

4.6 Hosting

The information registered「4.5 Register the menu in parameter sheet」menu is compiled for each operation by the internal processing「Host group decomposition function」and is further inherited to the target host until according to the host group association.
The information inherited by each target host can be viewed in the parameter sheet menu created in「4.1 Create Parameter Sheet」
Users can only view, but cannot Register/Update/Discard/Restore.



An example of the workflow of hosting is described below.

（1）The items registered in the parameter sheet menu are as follows.
（Information registered in「4.5 Register the parameter sheet menu」）

Target host or Host group	Operation	Item 1	Item 2
HG_1	2017/10/31_1001_OP1	111	AAA
HG_2	2017/10/31_1001_OP1	—	BBB
host_1a	2017/10/31_1001_OP1	222	—

（2） The parent-child relationship of the host group is as follows.
（Information registered「4.3 Defining parent-child relationship of host group」）

Parent host group	Child host group
HG_1	hg_1a
HG_1	hg_1b
HG_2	hg_2a
HG_2	hg_2b

（3）The association information of the Host group, operation, and target host is as follows.
（Information registered in「4.4 Associate host group with operation and target hosts」）

Host group	Operation	Target host
hg_1a	2017/10/31_1001_OP1	host_1a
hg_1b	2017/10/31_1001_OP1	host_1b
hg_2a	2017/10/31_1001_OP1	host_2a
hg_2b	2017/10/31_1001_OP1	host_2b

（4） If hosting is performed with the information registered in （1）～（3）,the record are as follows, users can know that the information is set to the target host until that belongs to the host group.

Target host	Operation			Item 1	Item 2
	Scheduled execution date	ID	Operation name		
host_1a	2017/10/31	1001	OP1	222 （※1）	AAA （※2）
host_1b	2017/10/31	1001	OP1	111	AAA
host_2a	2017/10/31	1001	OP1	— （※3）	BBB
host_2b	2017/10/31	1001	OP1	— （※3）	BBB

（※1） When you register an item in a host group and target host, the item in the target host takes the priority. Therefore,「222」is registered in host_1a is applied.

（※2） The item of the target host has priority, but in case if it is empty, it is inherited from the higher level. Since item 2 of host1_a was empty, So「AAA」of the parent host group HG_1 was inherited.

（※3） Item1 of host_2a and host_2b and is empty because item 1 of HG_2 is empty

4.7 Associate operation with setting value of the item in each target host

Associate the menus and items that were linked on the「Substitute value automatic registration setting 」menu screen with the variables of Movement. Users can Register/Update/Discard/Restore.
The registered information is reflected to the「Substitution value list」menu screen and「Target host」menu screen by internal process.

For more details, please refer to「Parameter Management Menu Guide」.

4.8 Reflect operation to the associated target host

The target host associated with the operation is automatically reflected. user can check the result on「Target host」menu screen.

For more details, please refer to「Parameter Management Menu Guide」.

4.9 Reflect substitution values

For each operation, the specific value is assign to the variable「VAR_」in the Playbook or template file used in the target Movement is automatically reflected.
The specific value here is the specific value entered in「4.5 Register the menu in parameter sheet」.The reflection result can be confirmed on the「Substitution value list」menu screen.

For more details, please refer to「Parameter Management Menu Guide」.

5. Host group variables

If user wants to refer a variable of the host name included in the host group as a specific value in a construction material (for example, the Playbook, etc.), then it is necessary to perform a procedure called Host group variable conversion.

5.1 The necessity of host group variable

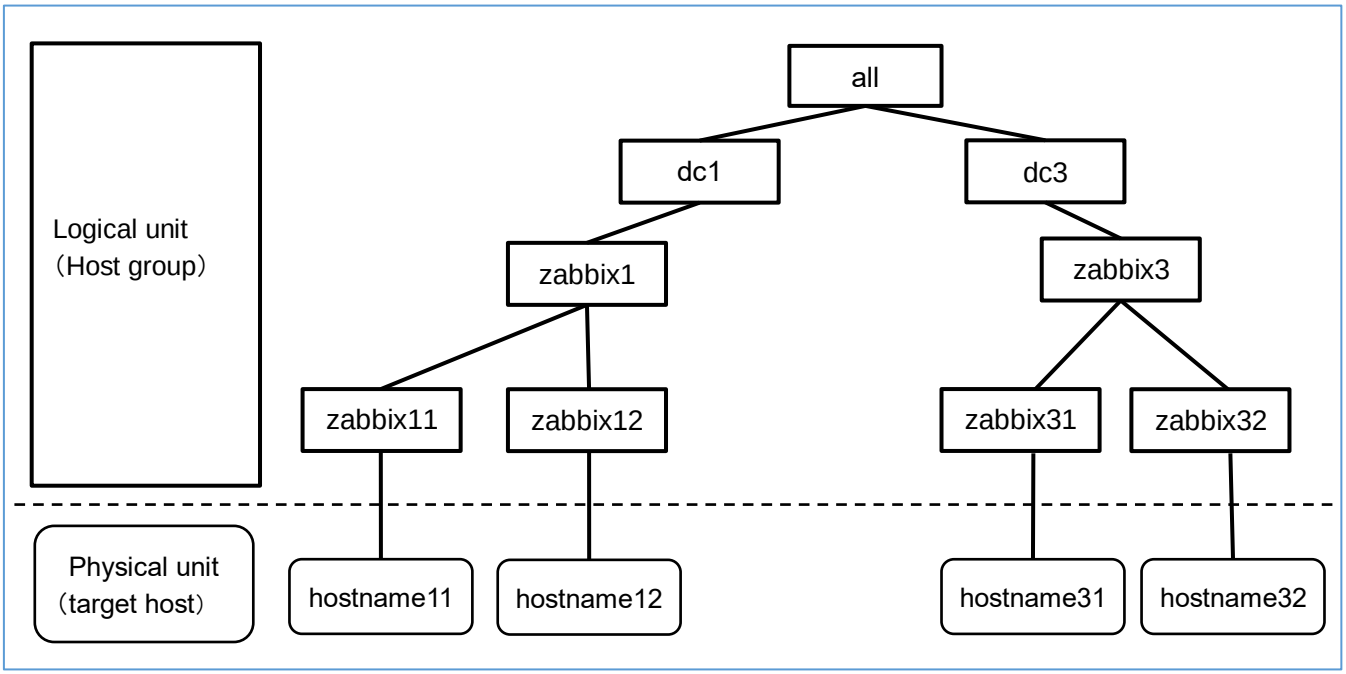
As an example, if you want to describe in the playbook that「Process A is executed when the target host belongs to the host group “my_group” in Ansible」,The following will be performed in ITA.

```
- Process A
    when: inventory_hostname in "{{ VAR_hostgroup_my_group }}"
```

The format of the host group variable is「VAR_hostgroup _host group name」.

In the above example, a list of host names belonging to my_group can be registered as specific values
In the host group variable VAR_hostgroup_my_group.

As another example, when the host group in the conceptual diagram described in「0 Overview of Host groups」is converted into host group variables, The specific values to be registered are as shown in table below.



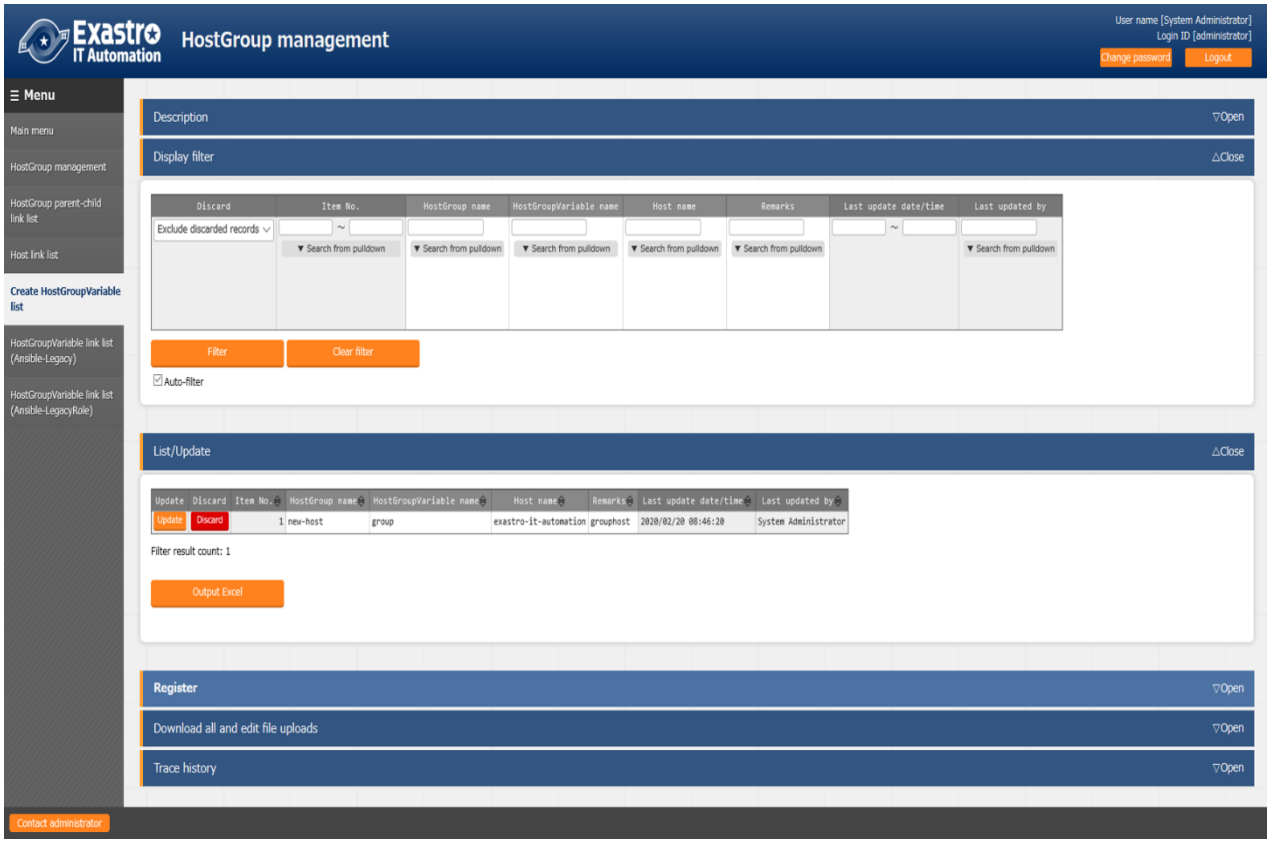
No	Host group name	Host group variable name	Specific value (The target host name that belongs to the host group)
1	all	VAR_hostgroup_all	hostname11
2			hostname12
3			hostname31
4			hostname32
5	dc1	VAR_hostgroup_dc1	hostname11
6			hostname12
7	zabbix1	VAR_hostgroup_zabbix1	hostname11
8			hostname12
9	zabbix11	VAR_hostgroup_zabbix11	hostname11
10	zabbix12	VAR_hostgroup_zabbix12	hostname12
11	dc3	VAR_hostgroup_dc3	hostname31
12			hostname32
13	zabbix3	VAR_hostgroup_zabbix3	hostname31
14			hostname32
15	zabbix31	VAR_hostgroup_zabbix31	hostname31
16	zabbix32	VAR_hostgroup_zabbix32	hostname32

The advantage of using host group variable conversion is that if the host group configuration changes due to change in parent-child linkage etc., it is automatically reflected in the specific values of the host group variables, so there is no need to manually change the contents of the specific values.

5.2 Referencing host group variables

Host group variable is automatically performed by the internal process「Host group variable conversion function」. Normally, manual updates are not possible.

When referring to the list of host group variables in the host group variable menu, if the last updater is the「Host group variable function」, the host group variables are converted by internal process.

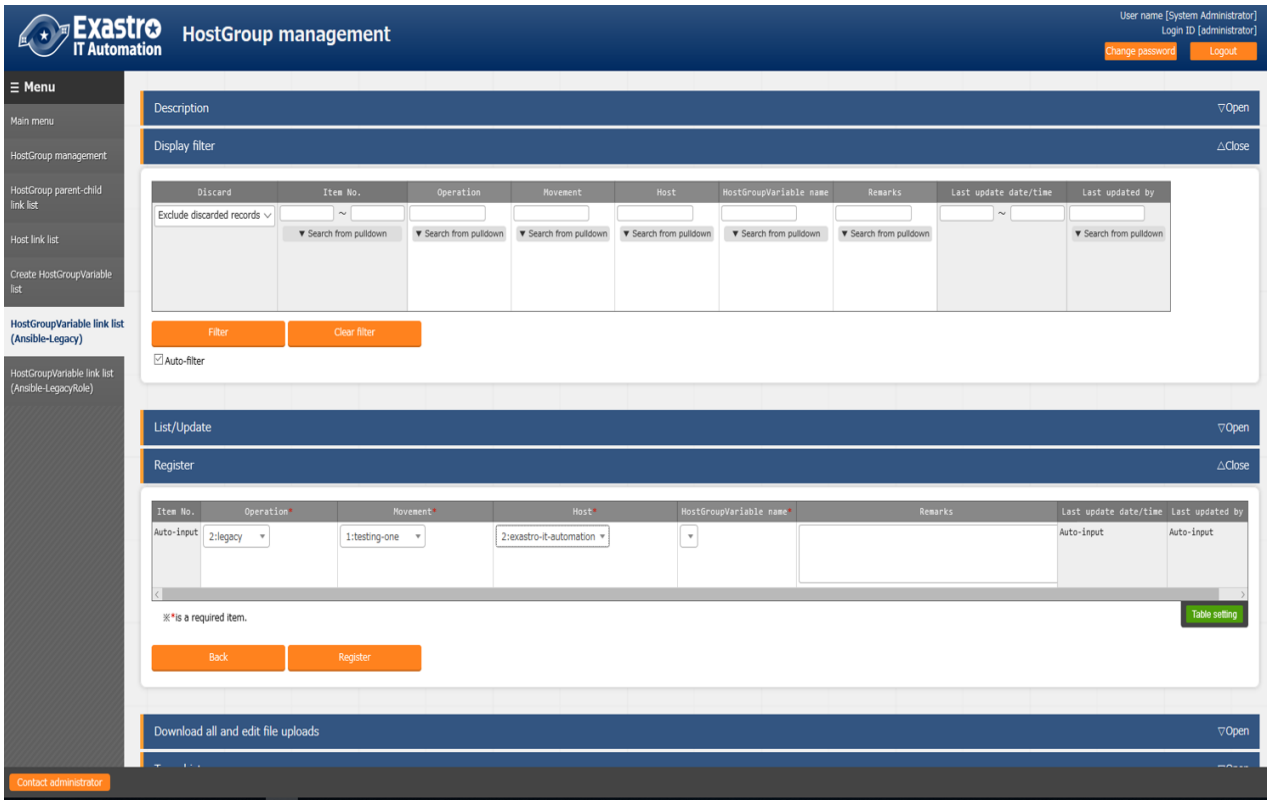


5.3 Register specific values for host group variables

Use the host group variable link list menu to link the operation, Movement, target host and host group variable.

After linking, the specific value (host name belonging to corresponding host group) is registered in the host group variable by the internal process「Host group variable registration function」.

There are multiple menus for linking host group variables. Here, the「Host Group variable link list (Ansible-Legacy)」menu will be described as an example.

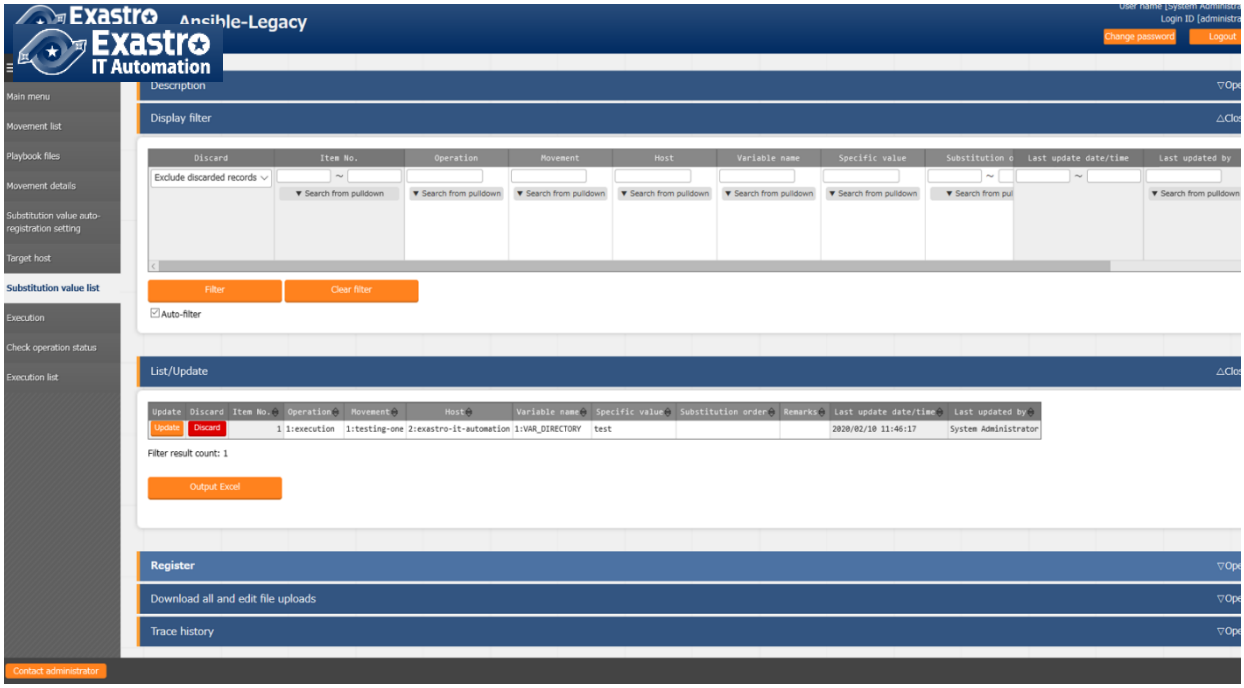


Column name	Description
Operation	Select an operation
Movement	Select a Movement.
Host	Select the target host
Host group variable name	Select the host group variable name

An example of specific value registration is explained under the following assumptions.

No	Assumption
1	HostA,hostB,hostC belong to the host group my_group
2	The target hosts for Movement1 are hostA and B
3	Host group i.e my_group is converted to host group variable (VAR_hostgroup_my_group)
4	The name of the operation to be executed is Operation1

Assumption 1 is defined in the「Host group Parent-Child link list menu」
Assumption 2 to 4 are linked using the「Host Group Parent-Child link list menu」
The record of the linked information is entered as follows.



After that, the host belonging to the VAR_hostgroup_my_group is registered as the specific value by executing the host group variable registration function.
The result of registering the specific value can be seen in the「Substitution value list」menu.
Please do not Update/Delete registration results.

6. Applicational Operation

Operations that utilize the host group function include not only input by the user from the browser screen of the client PC, but also operations by system operation and maintenance. The operation and maintenance are as follows.

- Maintenance
- Change log level

6.1 Maintenance

The following files are required to Start/Stop/Restart the host group function process.

Description	Target file name
Host group variable conversion function Convert a host group and its associated host into variables.	ky_hostgroup_make_var.service
Host group variable registration function. In the Ansible-Legacy console, data is set in ITA target host and assigned the value management based on the host group variable association menu.	ky_hostgroup_regist_var_legacy.service
Host group variable registration function In the Ansible-Legacy console, data is set in ITA target host and assigned the value management based on the host group variable association menu.	ky_hostgroup_regist_var_legacy_role.service
Host group decomposition function Decompose design information which is entered in host group and host group units.	ky_hostgroup_split.service
Loop check function This function checks whether the parent-child relationship of the host group is in a loop.	ky_hostgroup_check_loop.service

The target file is stored in 「/usr/lib/systemd/system」.The method of Start/Stop/Restart a process is as follows. Please execute the command with root privileges.

① Process start

```
# systemctl start ky_hostgroup_split.service ↵
```

② Process stop

```
# systemctl stop ky_hostgroup_split.service ↵
```

③ Process restart

```
# systemctl restart ky_hostgroup_split.service ↵
```

Similarly, please replace each target file name to start/stop/restart the process.

6.2 Change log level

① Change to NORMAL level
Rewrite「DEBUG」on the 8th line of the target file to「NORMAL」
Log level setting file: <Install directory>/ita-root/confs/backyardconfs/ita_env

② Change to DEBUG level
Rewrite「NORMAL」on the 8th line of the target file to「DEBUG」
Log level setting file: <Install directory>/ita-root/confs/backyardconfs/ita_env

After rewriting, the log level change is effective after restarting (restart) the process.

Please refer to「6.1 Maintenance」to restart.
Log file output destination: <Install directory>/ita-root/logs/backyardlogs