initMAX

Real-Life Examples:

Unleashing the Power of Zabbix Item Scripts for Automation

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Zabbix Summit 2023

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ZABBIX can’t do ….

Really?

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Challenge 01

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Zabbix can't discover the SNMP community string.

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You can't guess the community string. What do you really need?

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No external scripts are allowed. Everything must be configured inside of Zabbix frontend.

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No external scripts are allowed. Everything must be configured inside of Zabbix frontend.

Okay, That's challenge!

CHALLENGE 01

TASK DEFINITION

- Customer has plenty of devices **configured by partners** with set of SNMP community strings
- We need to **automate adding these devices** to Zabbix, set correct community string, move to target Group, Link Templates
- **All devices are also monitored** by ICMP ping. But some devices will be monitored only by ICMP

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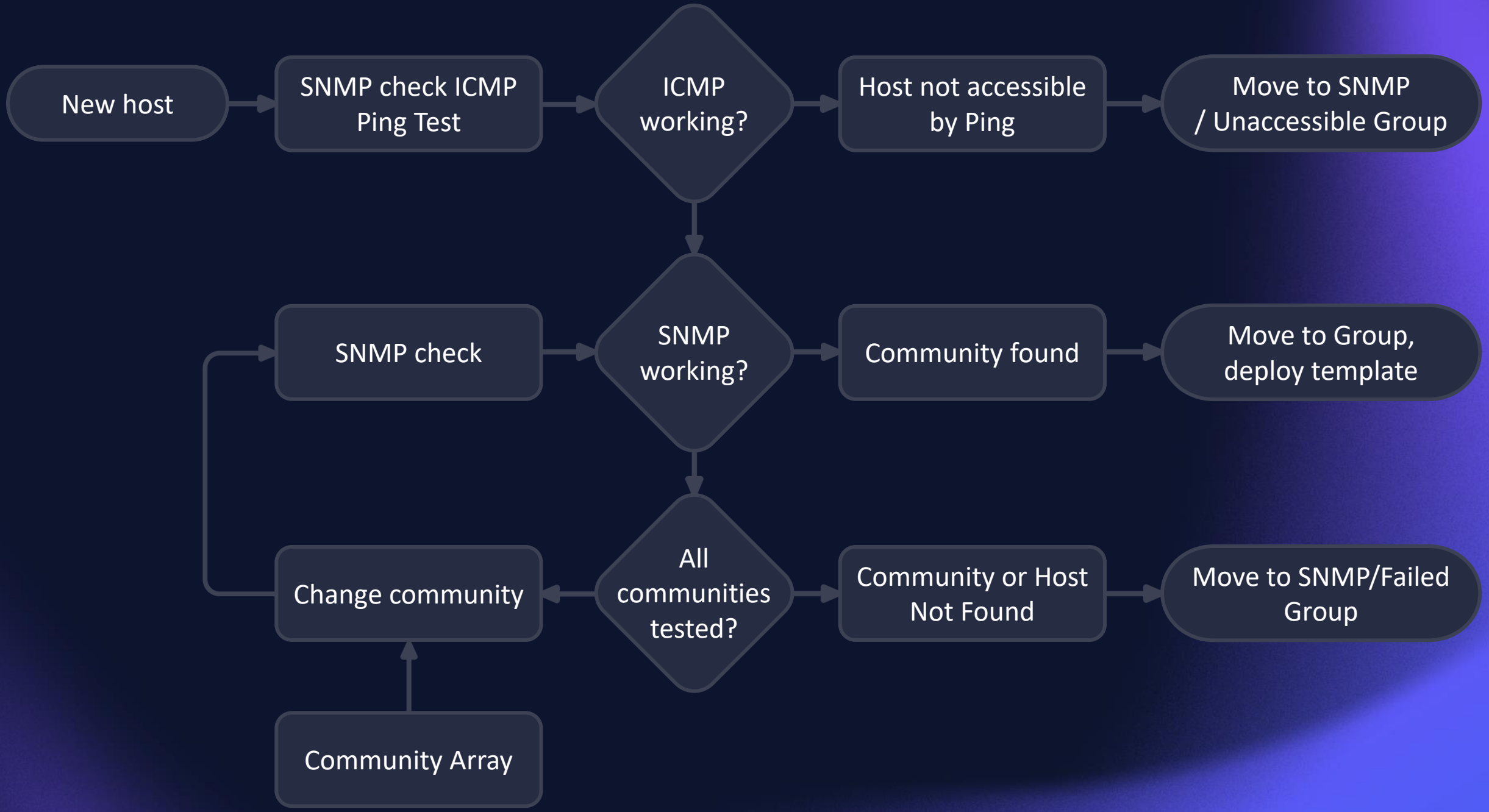
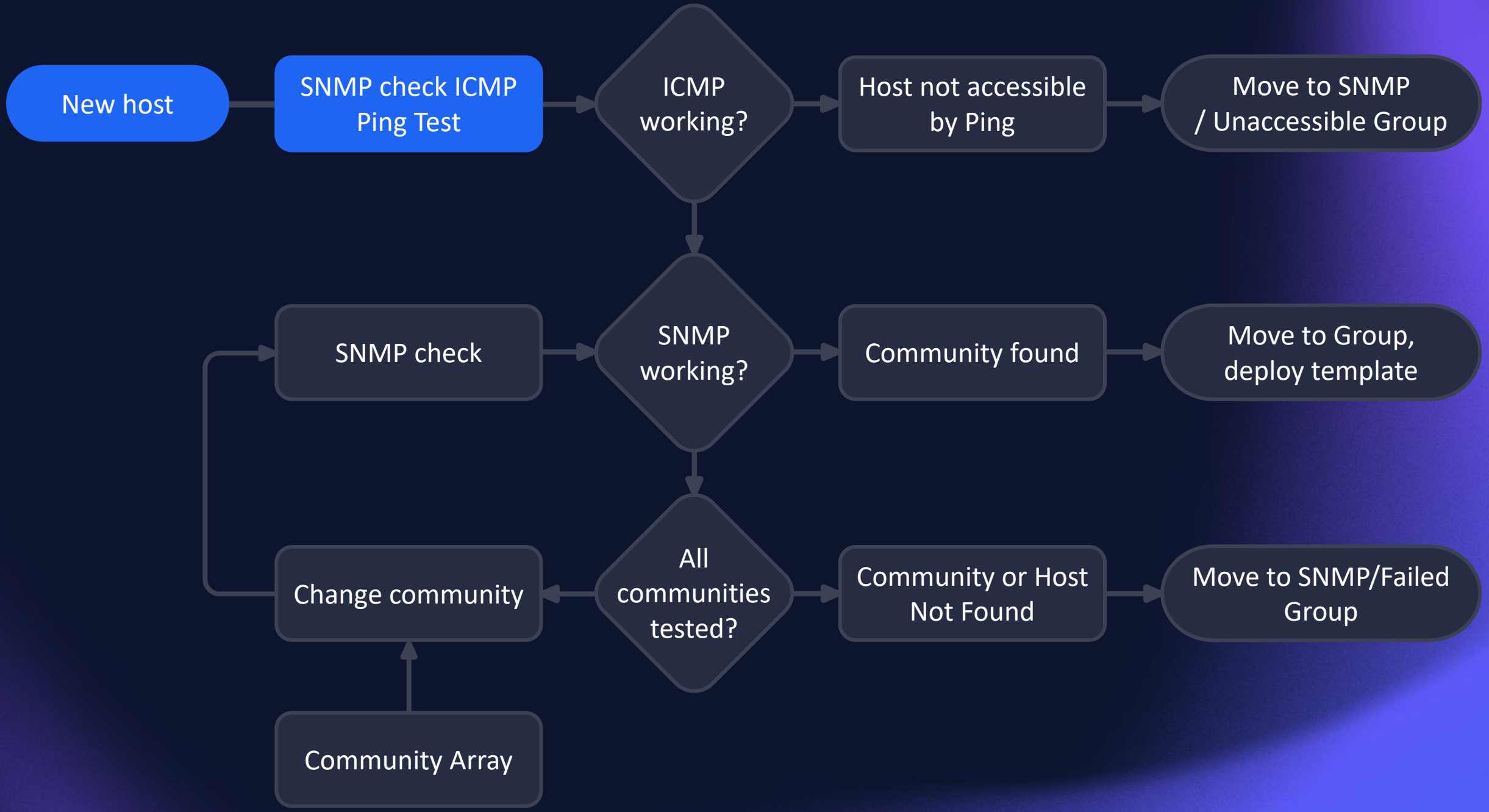
CHALLENGE 01

TASK DEFINITION

We need to automate adding these devices to Zabbix, set correct community string, move to target Group, Link Templates


New host
SNMP check ICMP Ping Test
ICMP working?
Host not accessible by Ping
Move to SNMP / Unaccessible Group
SNMP check
SNMP working?
Community found
Move to Group, deploy template
Change community
All communities tested?
Community or Host Not Found
Move to SNMP/Failed Group
Community Array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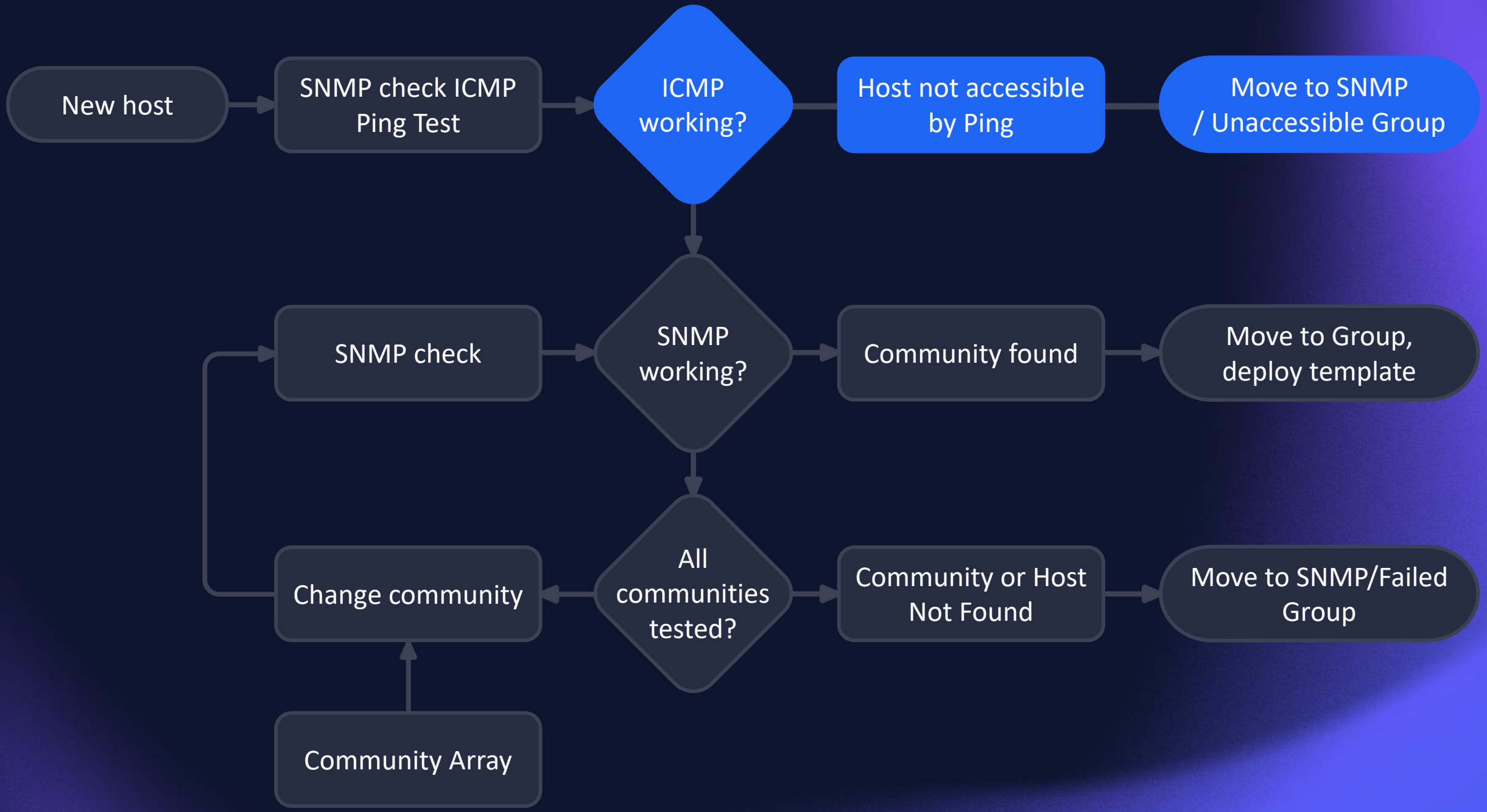
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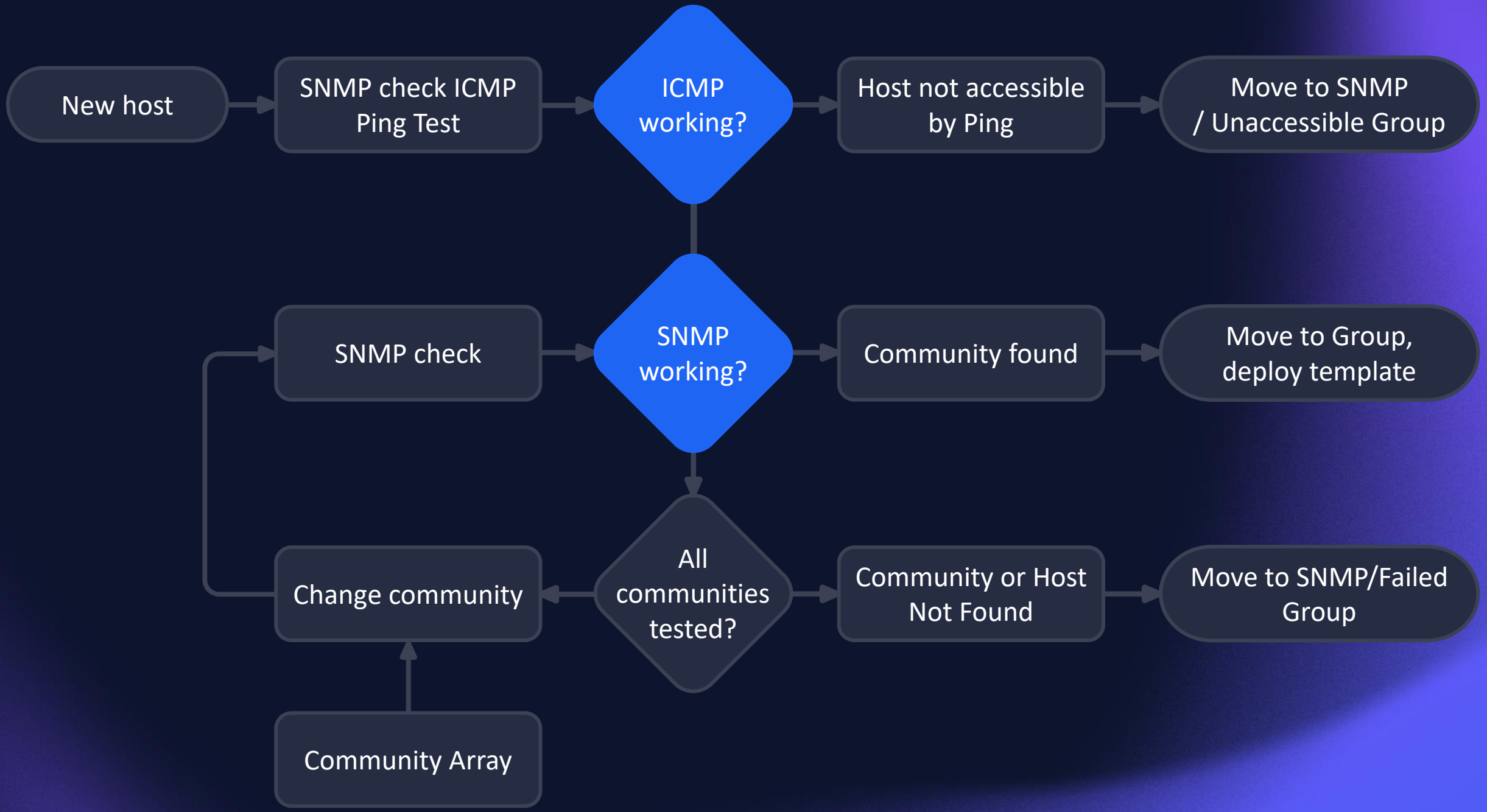
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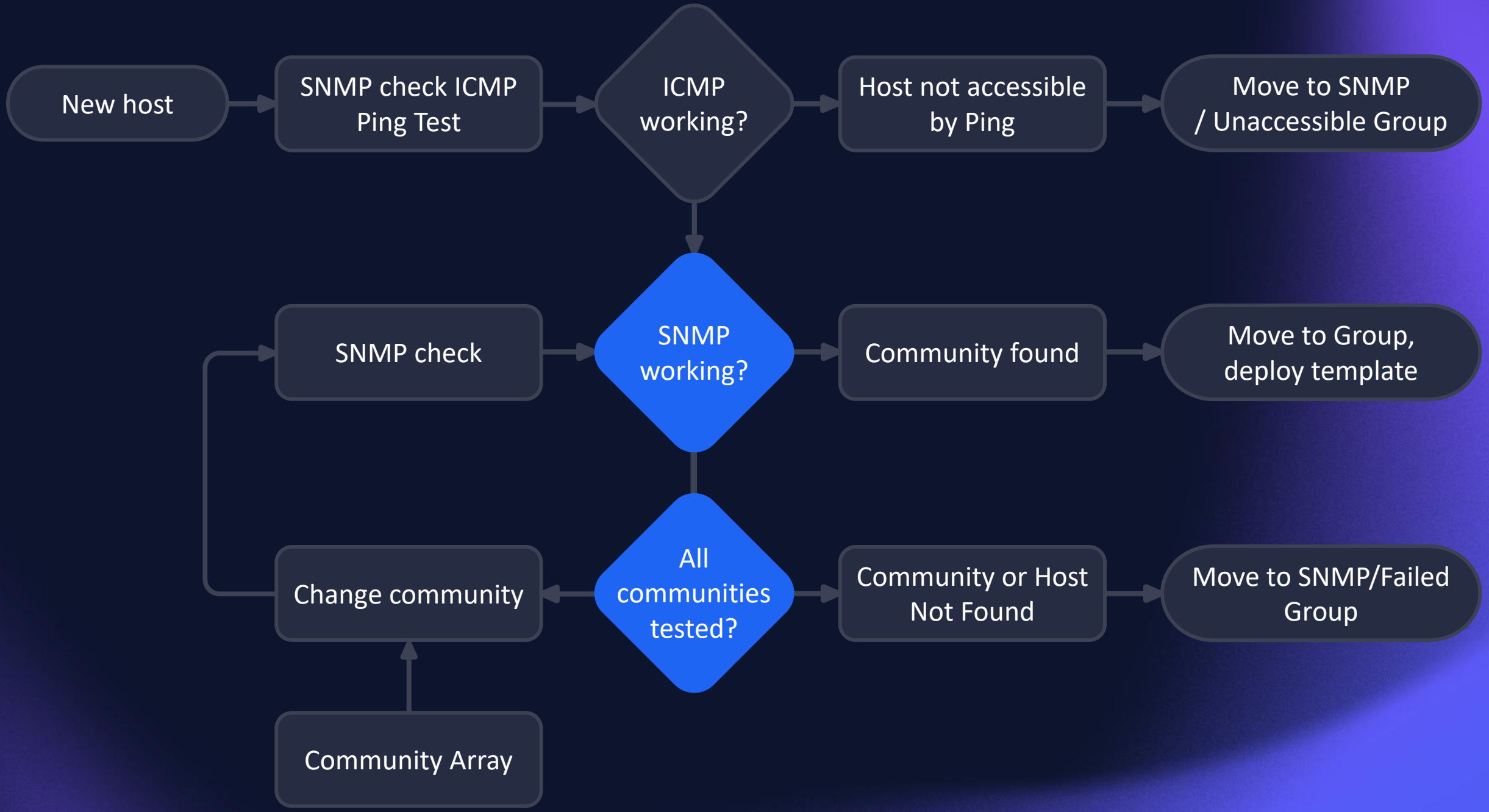
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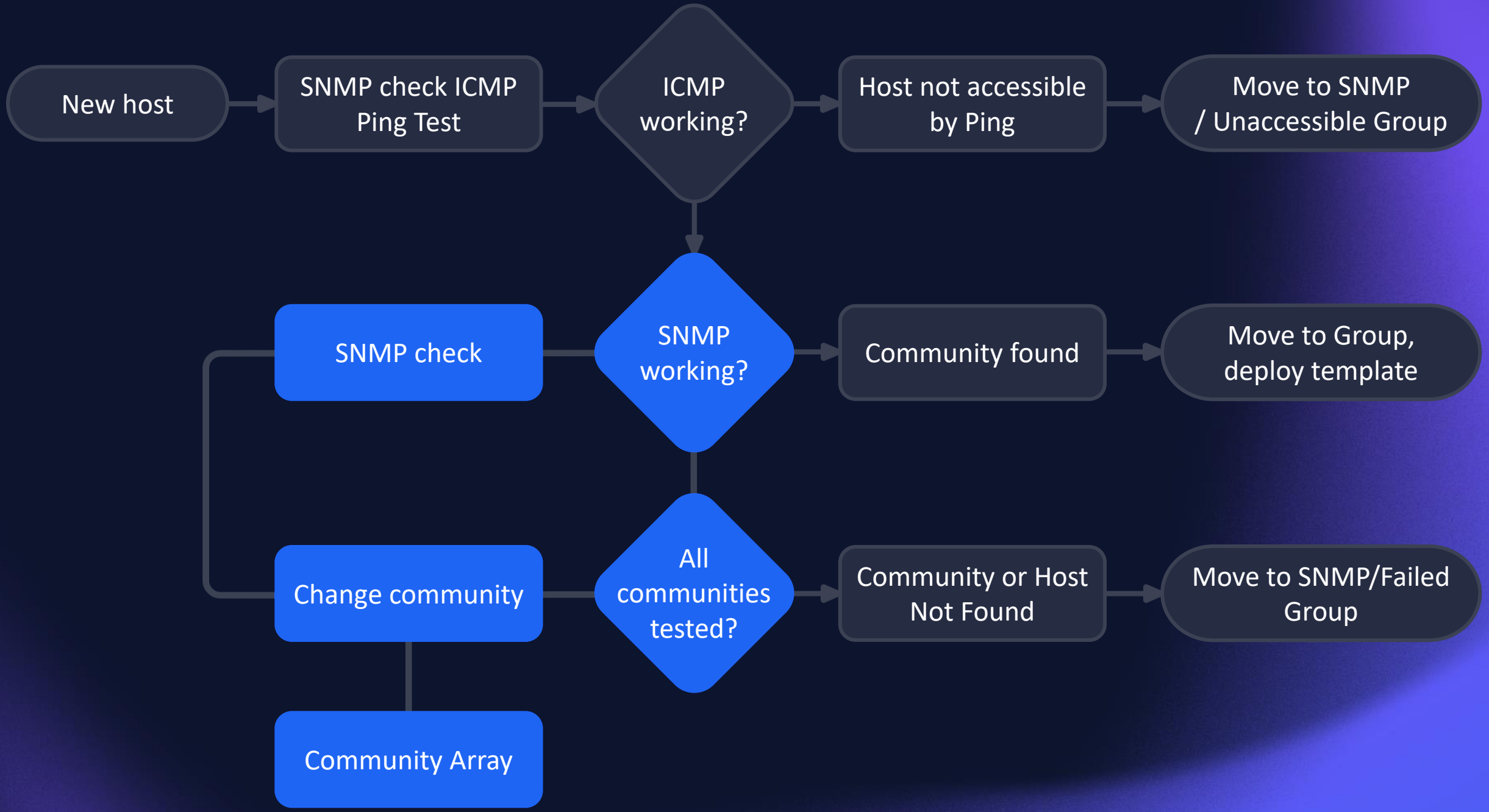
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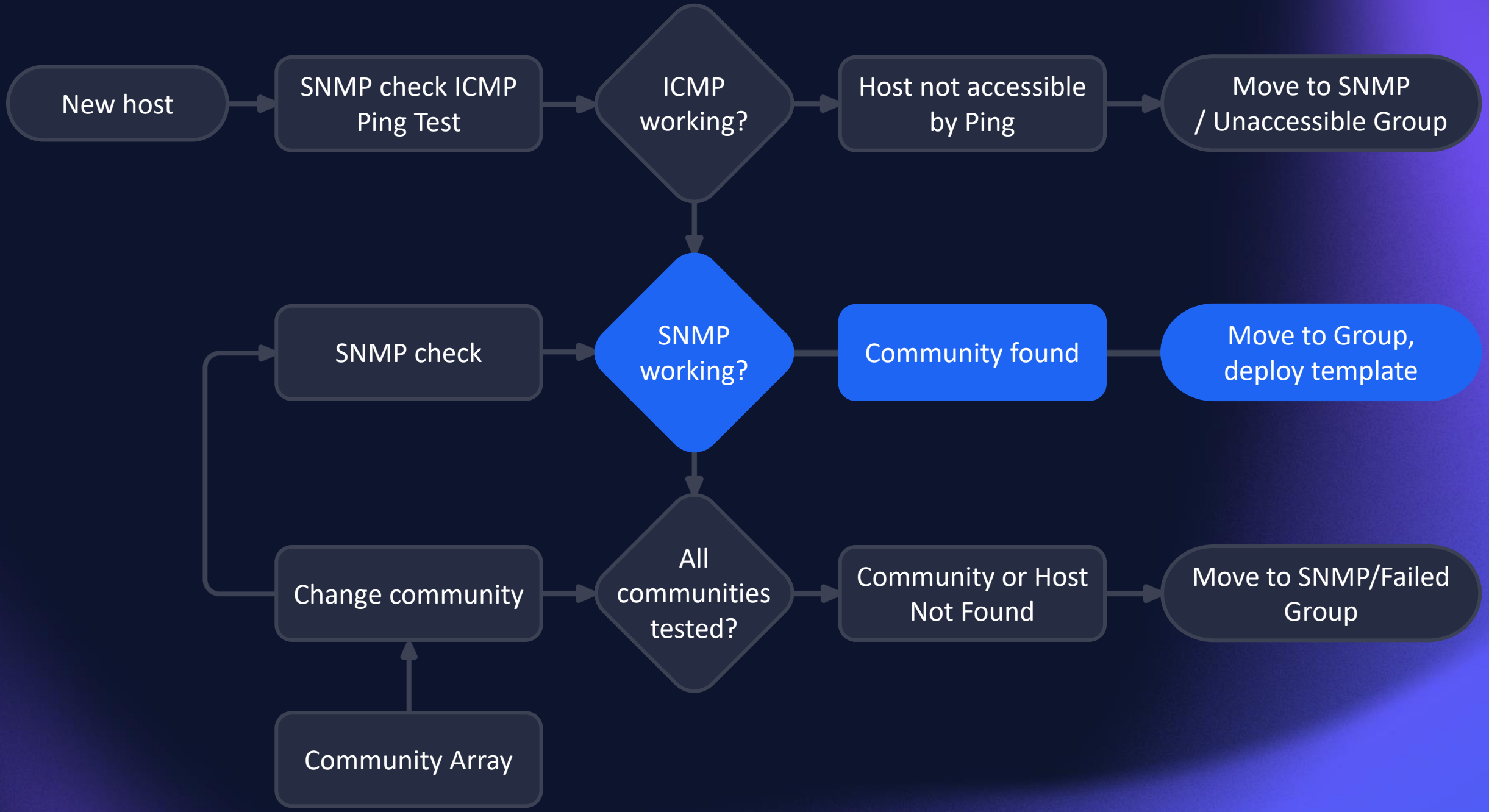
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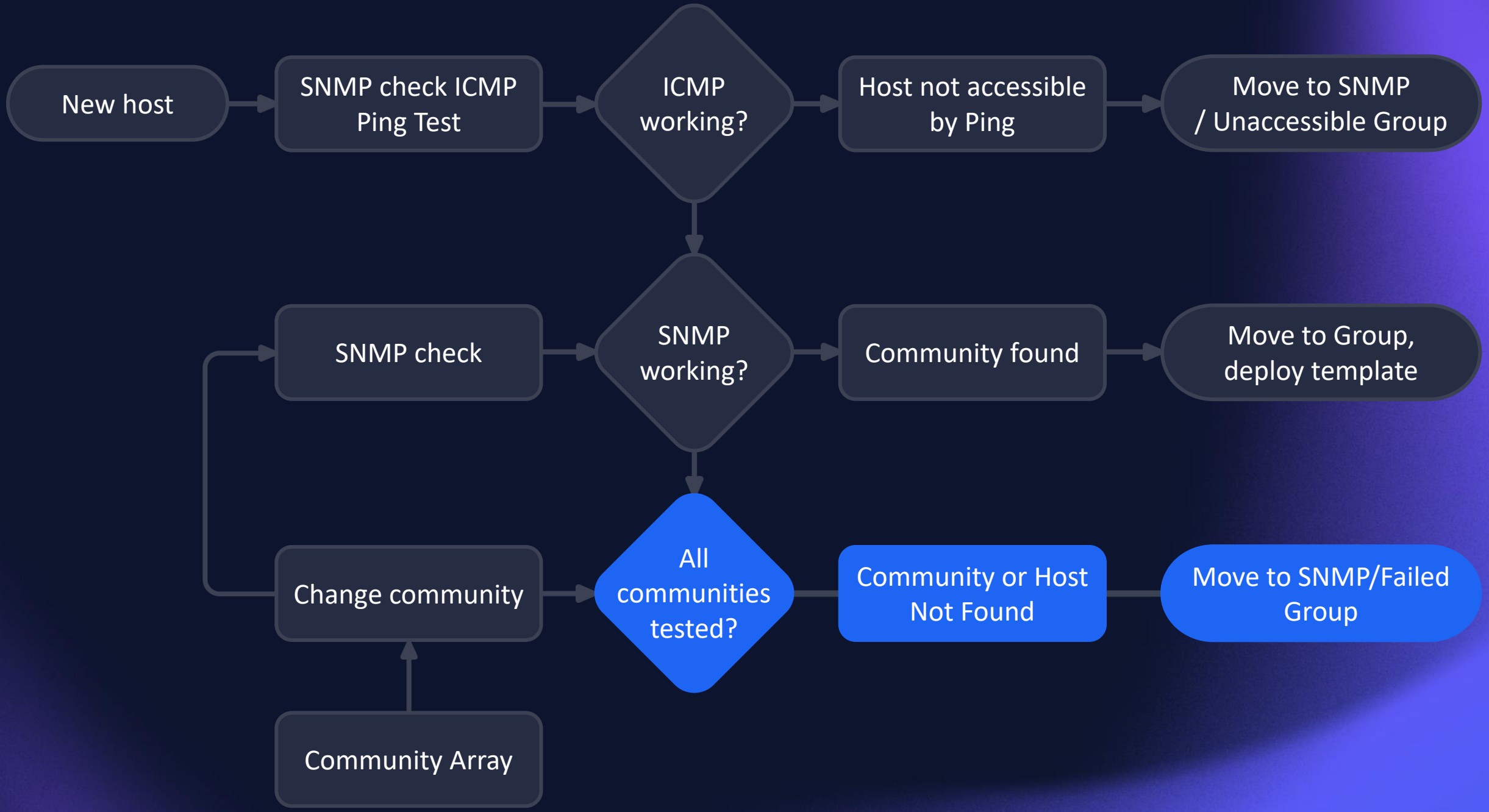
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CHALLENGE 01

HOW TO CHECK ICMP?

Items:

ICMP status

Triggers:

Ping Failed

max(/SNMP community discovery/icmpping[{HOST.IP},3],#2)=0

CHALLENGE 01

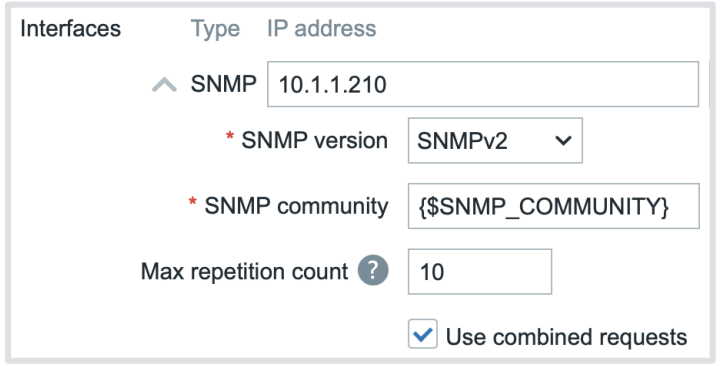
HOW TO CHECK SNMP?

Items:

SNMP cycle check

common OID - 1.3.6.1.2.1.1.1.0 - sysDescr

SNMP Availability internal check



Triggers:

SNMP community found

last(/SNMP community discovery/snmp.cycle2)<>"fail" or last(/SNMP community discovery/zabbix[host,snmp,"available"])=1

SNMP failed - change community

last(/SNMP community discovery/snmp.cycle2)="fail" or last(/SNMP community discovery/zabbix[host,snmp,"available"])<>1

CHALLENGE 01

SET COMMUNITY STRING

Macros: {$SNMP_COMMUNITY}
{$SNMP_COMMUNITY_ARRAY}

Script:

```
if (zbx_macros != null) {
        curentValue = zbx_macros.value;
        position = arr.indexOf(curentValue);
        hostmacroid = zbx_macros.hostmacroid;
        update_result = updateHostMacros(hostmacroid,arr[position + 1]);
    } else {
        update_result = createHostMacros(zbx_hostid,macro_name,new_value);
    }
```

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CHALLENGE 01

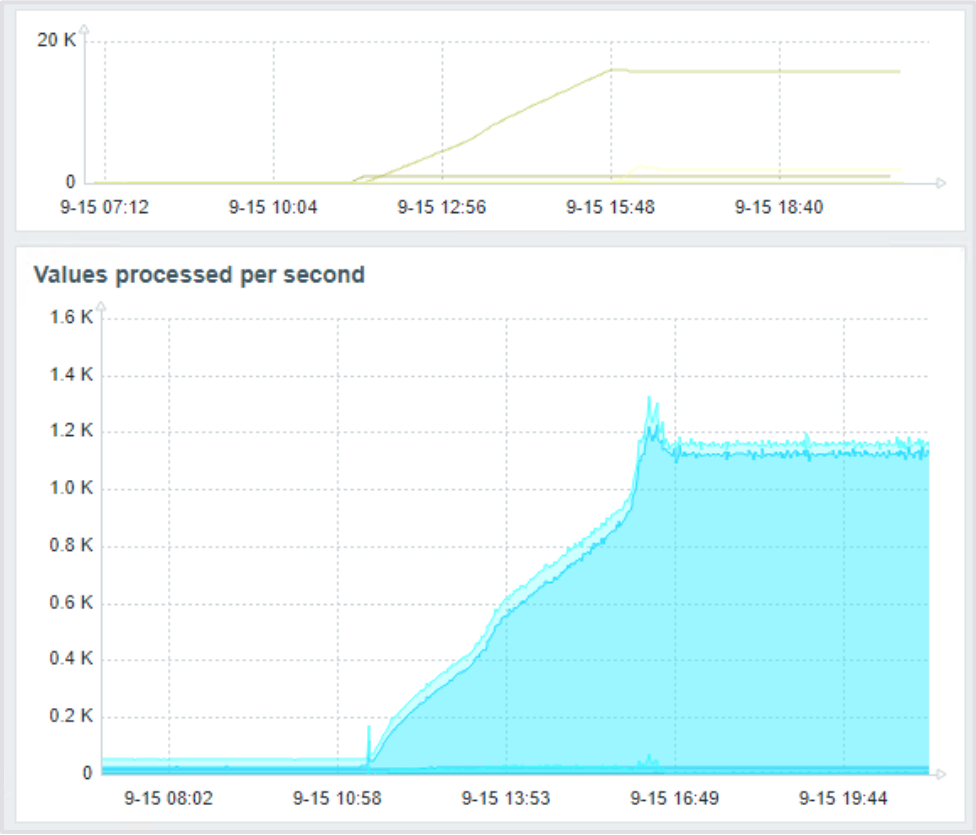
ALL COMMUNITIES TESTED?

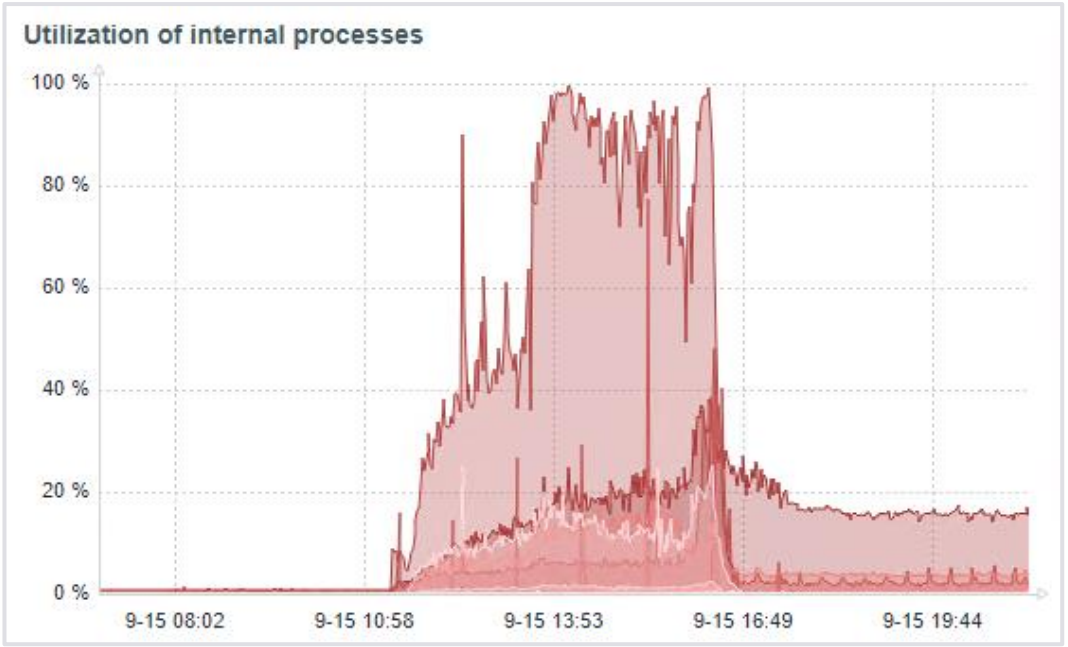
```
last(/SNMP community discovery/zabbix[host,snmp,"available"])<>1 and
{$SNMP_COMMUNITY} = "NotFound"
```

SNMP failed - Cycle completed

CHALLENGE 01

REAL IMPORT 20k HOSTS





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CHALLENGE 01

TECHNICAL DECISIONS

In a real world there is much more complexity

ICMP only devices, …
Add host -> detect SNMP -> Move to Group -> Link Templates -> Enable | Disable Host

Timing

ICMP Timeouts
SNMP Timeout
Update interval
Trigger settings
Configuration cache + Proxy update interval
User macros can be used as secret macros

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Challenge 02

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We need proxy in HA – Zabbix can’t do this natively!

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For what type of checks?

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Only for passive SNMP check monitored by SNMP agent.

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For what type of checks?

Only for passive SNMP check monitored by SNMP agent.

Passive checks - Why not?

We need to automate switching to failover proxy.

Okay, that's a challenge!

Challenge 02

TASK DEFINITION

- **ZABBIX proxy in HA** mode is a necessary condition for the project
- **Whole automation** must be configured using the Zabbix frontend
- **No advanced features** such as failback or load balancing are required

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02

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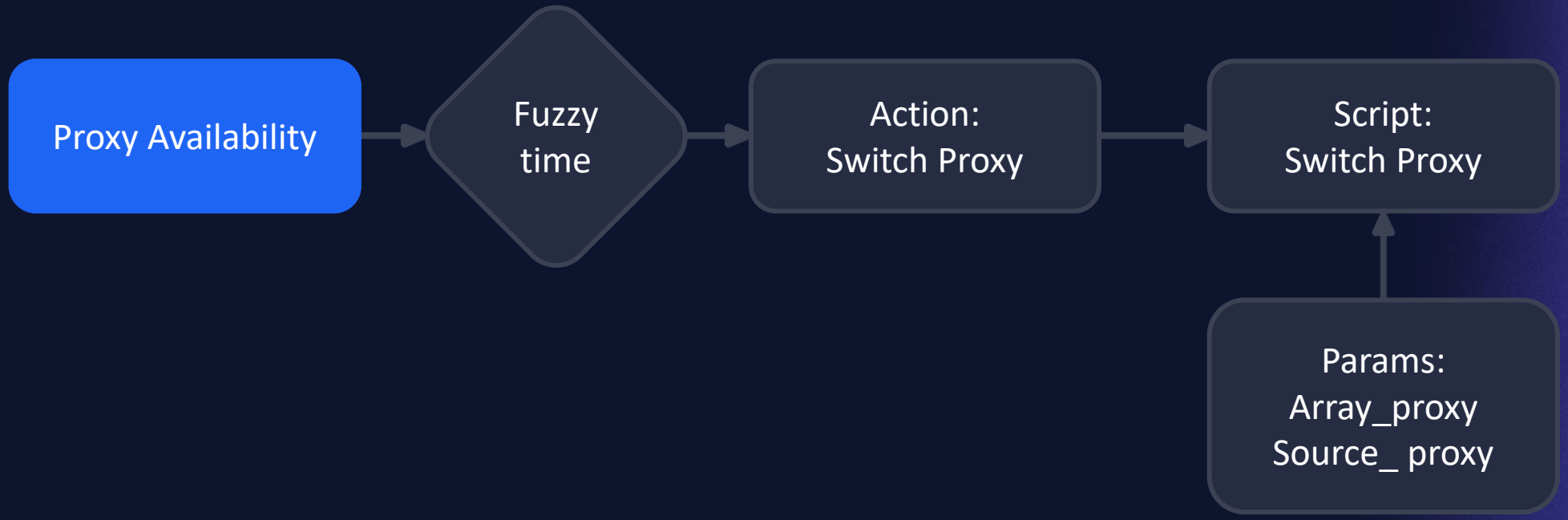
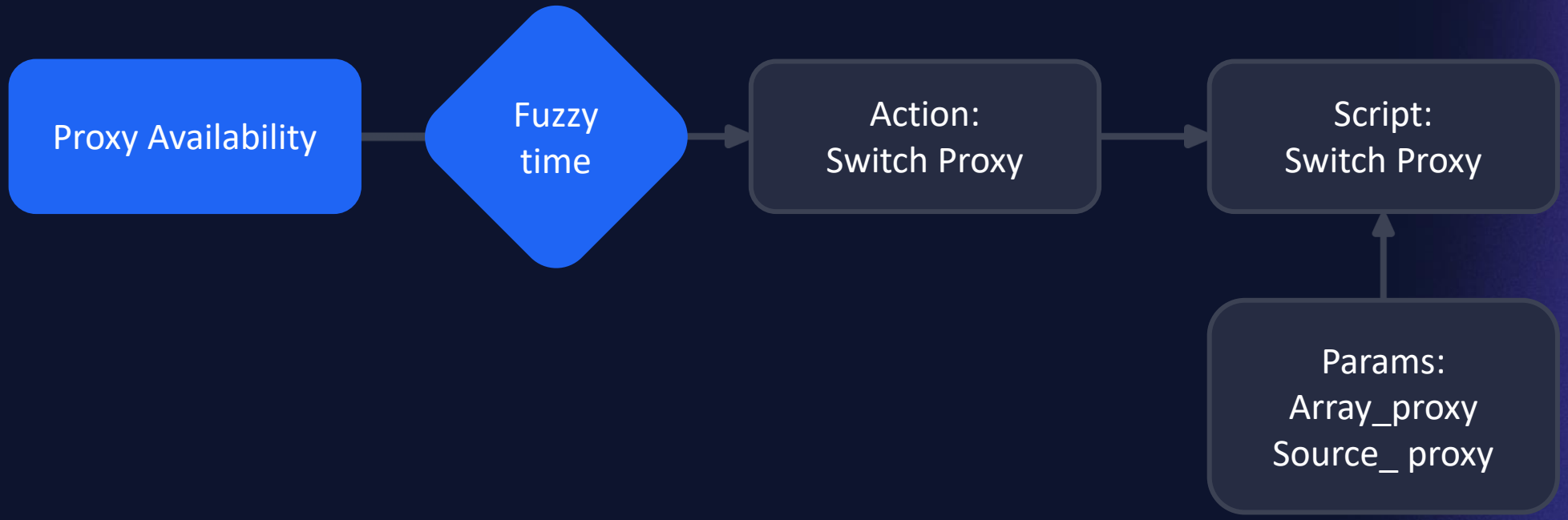

Proxy Availability
Fuzzy time
Action: Switch Proxy
Script: Switch Proxy
Params: Array_proxy Source_ proxy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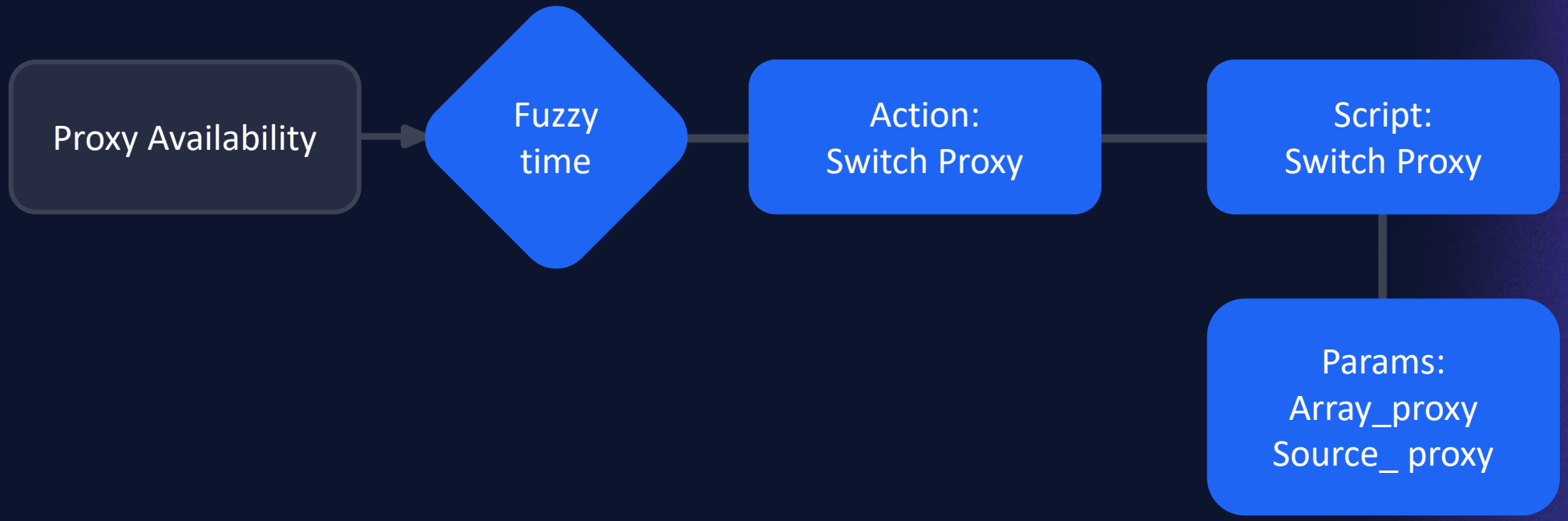
Proxy Availability
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CHALLENGE 02

PROXY AVAILABILITY

Macros, Tags:

{$HA.PROXY}
HA: Proxy01,Proxy02

Item:

zabbix[proxy,{$HA.PROXY}{HOST.NAME},lastaccess]

Trigger:

fuzzytime(/Proxy HA/zabbix[proxy,{$HA.PROXY}{HOST.NAME},lastaccess],1m)=0

CHALLENGE 02

SWITCH PROXIES

Action -> Script:

```
if(arrayProxy[0] === sourceProxy){
    newProxyID = proxies[proxies.map(function(e) { return e.host;
          }).indexOf(arrayProxy[1])].proxyid;
          } else {
              newProxyID = proxies[proxies.map(function(e) { return e.host;
          }).indexOf(arrayProxy[0])].proxyid;
          }

var hostsToChange =
(JSON.parse(getProxyHosts(sourceID)).result).concat(JSON.parse(getProxyHosts(newProxyID)).result);
```

CHALLENGE 02

ADVANCED HA

Failback – not in project scope

Macro with „default proxy“.

Balancing of proxy utilization

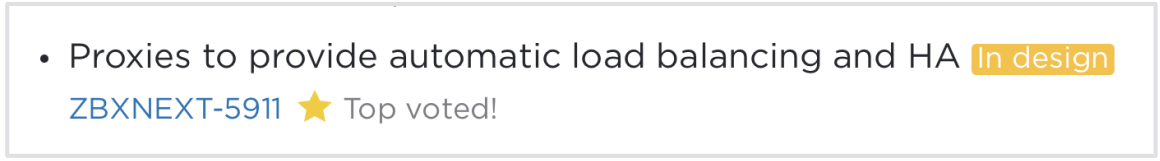
Can be done by balancing check.

Active checks

Can be solved partially by using Auto-registration.

Zabbix 6.4 - cache update - default - 10s

Zabbix 7.0 - ?



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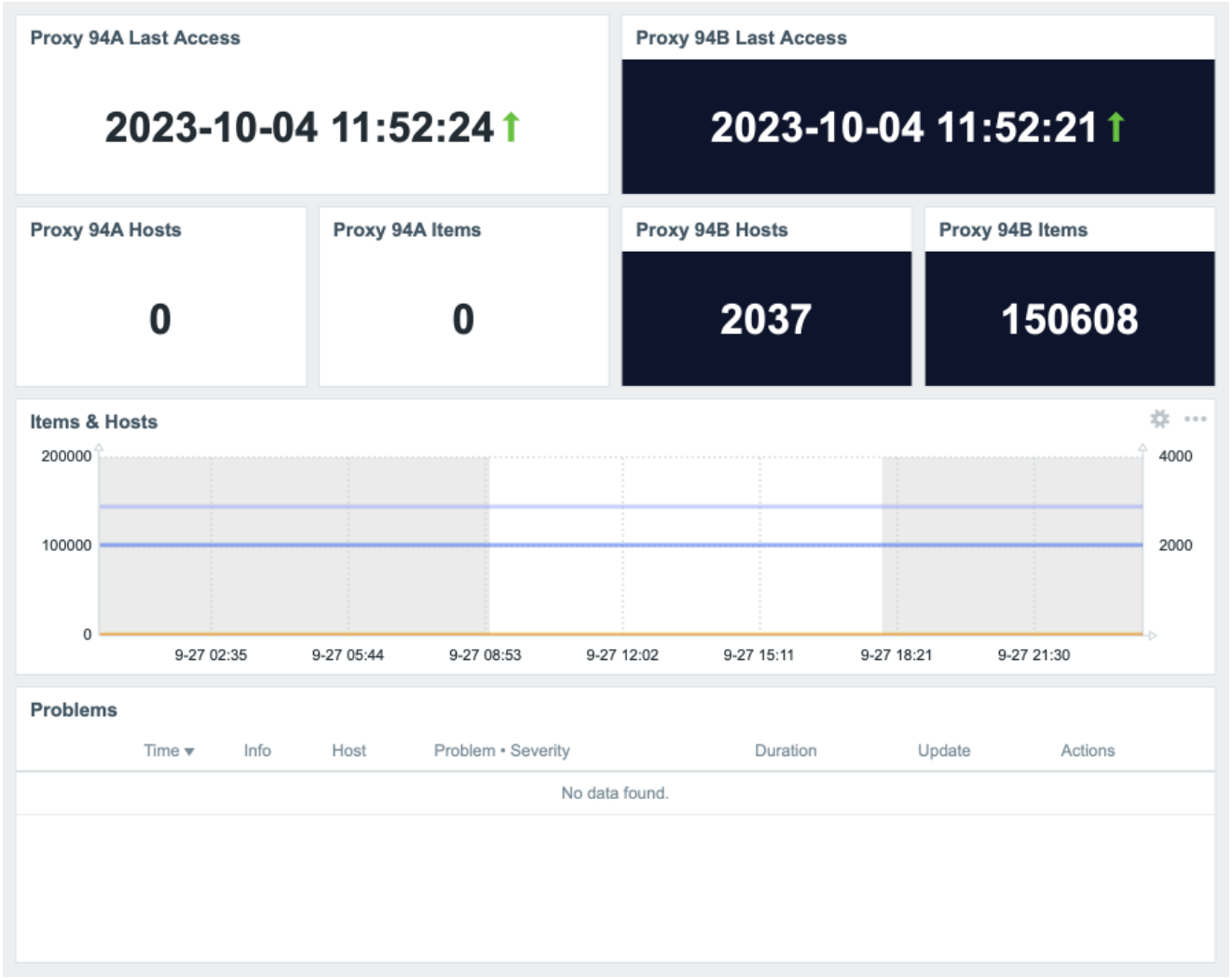
CHALLENGE 02

Proxy 94B offline



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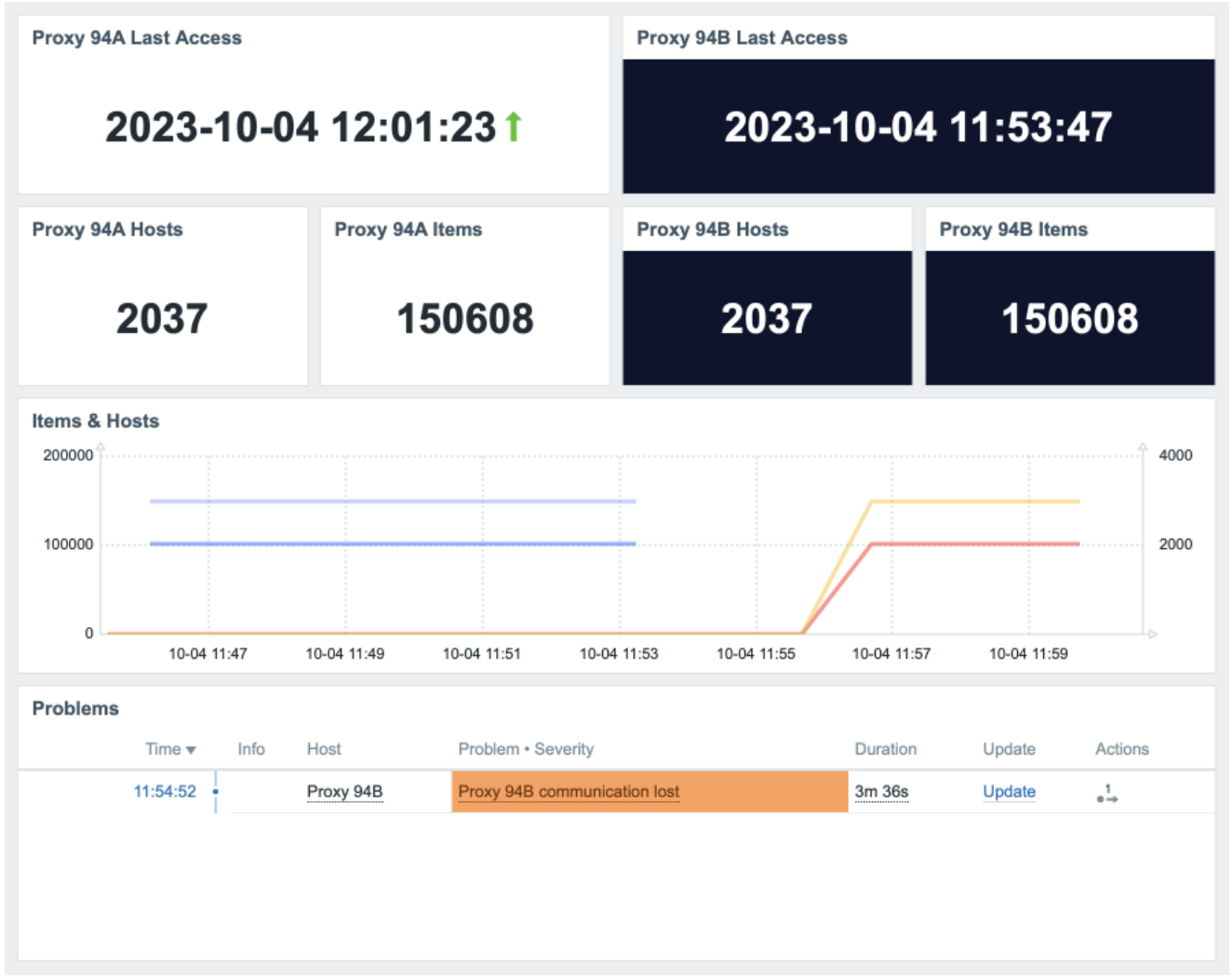
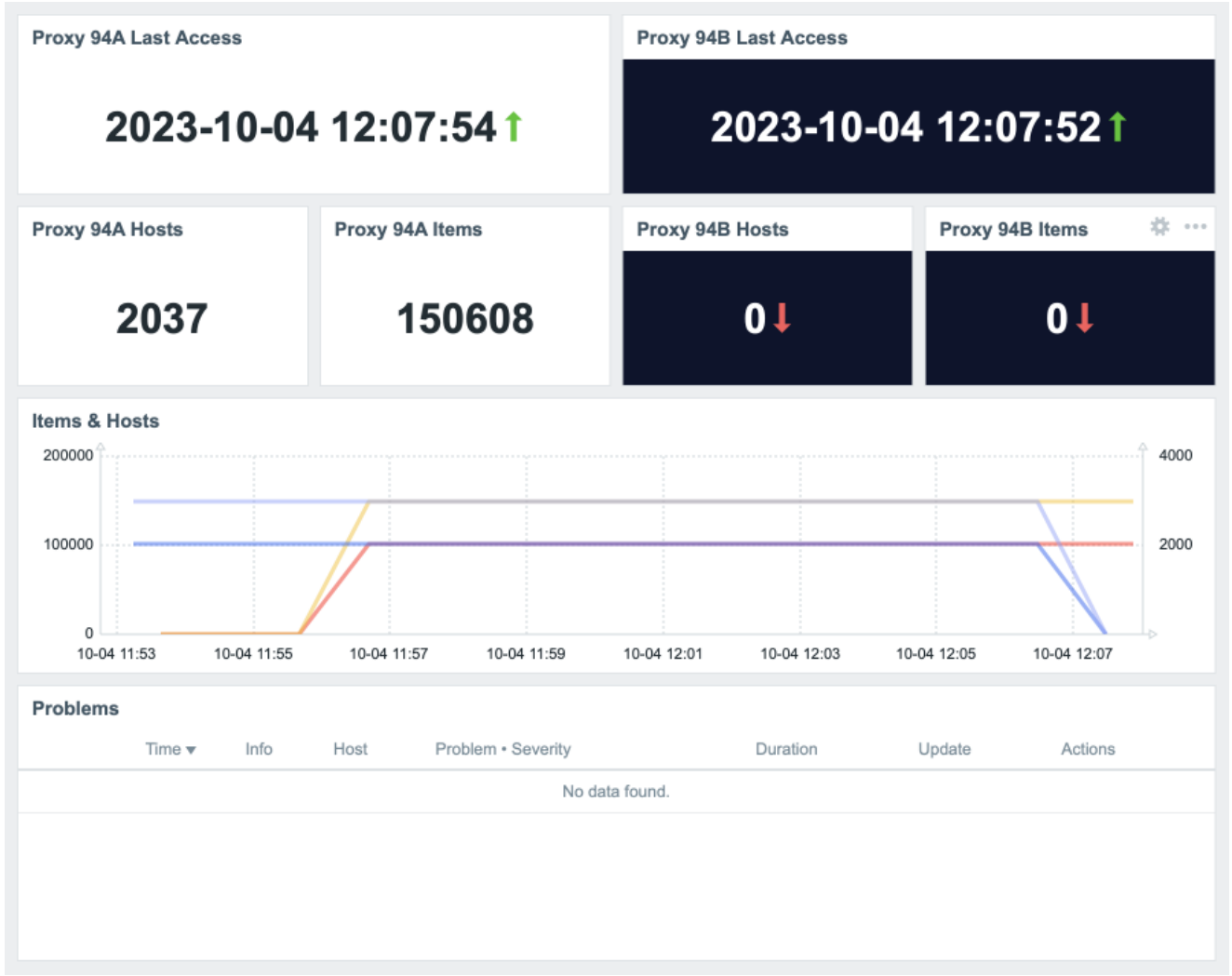
CHALLENGE 02

Both online



CHALLENGE 02

Both Online Again



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Challenge 03

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We want to use single template for more setups!

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Can Zabbix read config somewhere?

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No, it has to be configured manually and the configuration must be as simple as possible.

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We want to use single template for more setups!

Can Zabbix read config somewhere?

No, it has to be configured manually and the configuration must be as simple as possible.

OK, let’s use „Static“ LLD

CHALLENGE 03

„Static“ LLD

Copy of a template, macro name change, key conflicts and more - Solution?

Macro with array of values -> LLD on script item

Template based on macro value
What if You want more?

Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version
Multiple Website certificate by Zabbix agent 2	Hosts 1	Items 1	Triggers	Graphs	Dashboards	Discovery 1	Web	initMAX s.r.o.	1.0
Website certificate by Zabbix agent 2	Hosts 2	Items 13	Triggers 3	Graphs	Dashboards	Discovery	Web	Zabbix	7.0-0

CHALLENGE 03

TASK DEFINITION

- **Single host** for multiple checks of the same type
- **Manual configuration** and as simple as possible definition of monitored items
- **User friendly** configuration
- **Simple example** certificate monitoring

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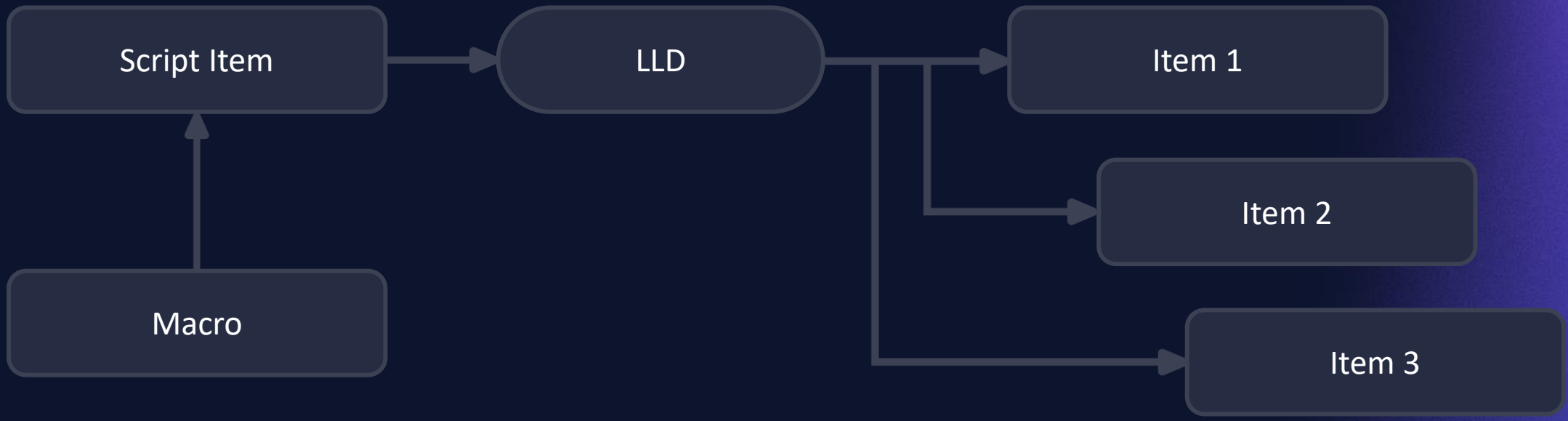

CHALLENGE 03

CASE STUDIES

- **More certificates** monitored on one host with a single template
- **More DNS targets** on one host with a single CloudFlare template
- **Interconnection checks** between database instances

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CHALLENGE 03

ONE HOST CERTs

initmax.cz	**2023-11-06 22:18:09** Expiration time	 33 days Cert: Days to Expire of initmax.cz	**valid** Validation result
git.initmax.cz	**2023-12-26 22:14:40** Expiration time	 83 days Cert: Days to Expire of git.initmax.cz	**valid** Validation result
initmax-cz.mail...	**2024-03-06 00:59:59** Expiration time	 153 days Cert: Days to Expire of initmax-cz....	**invalid** Validation result

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Challenge 04

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We need Geomaps.

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We need Geomaps.

OK, where can Zabbix get locations?

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We need Geomaps.

OK, where can Zabbix get locations?

We don’t have locations ☹
But we have addresses.

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OK, where can Zabbix get locations?

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Okay, that's a challenge!

CHALLENGE 04

CASE STUDIES

- Convert **Address** to geolocation coordinates.
- **Do it automatically** as simple as possible.

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CHALLENGE 04

TECHNICAL DECISIONS

Many online geoAPIs available – my choice: Google geocoding API

```
var request = new HttpRequest();
  request.addHeader('Content-Type: application/json');
  request.setProxy("{$HTTP_PROXY}");
var apiKey = "{$GOOGLE.GEOAPIFY.KEY}";

var address = encodeURI(address);
var url = "https://maps.googleapis.com/maps/api/geocode/json?address=" + address +
"&key=" + apiKey;

response = request.get(url);
return response;
```

CHALLENGE 04

TECHNICAL DECISIONS

Zabbix 6.4 - Script item

{INVENTORY.LOCATION} can be used as Script item parameter

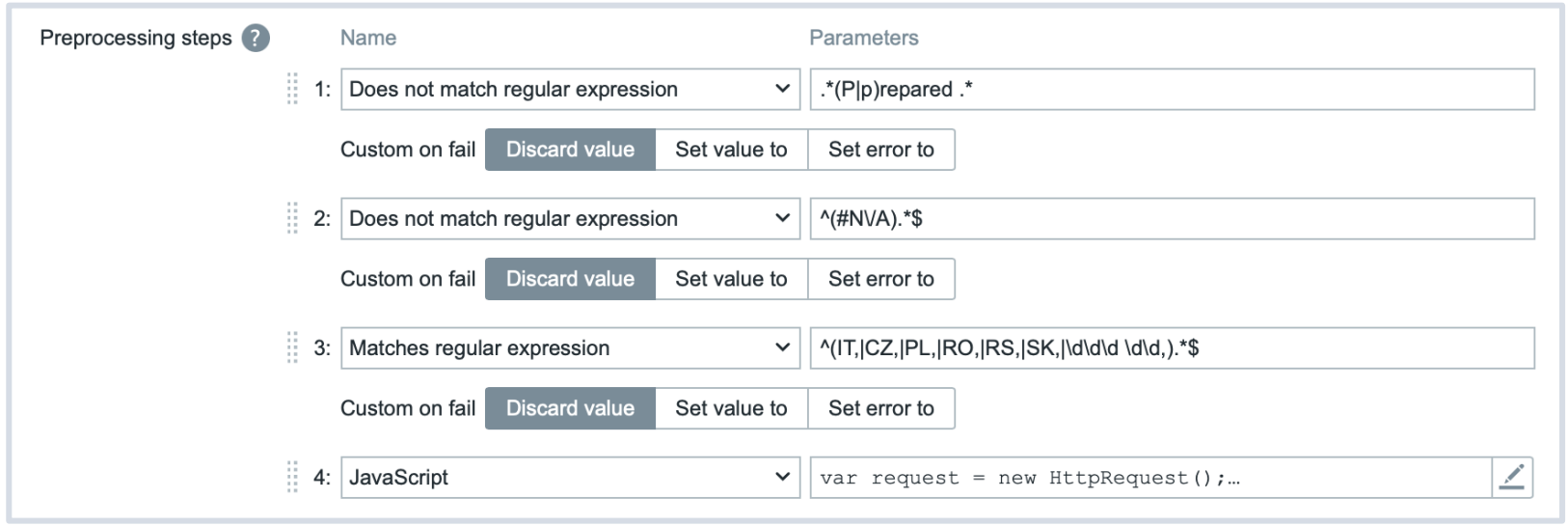
Zabbix 6.2 and older - Dependent item with JavaScript preprocessing

{INVENTORY.LOCATION} cannot be used in script item.
Master Item gets the address.

CHALLENGE 04

CONFIGURATION

Dependent Item with script preprocessing

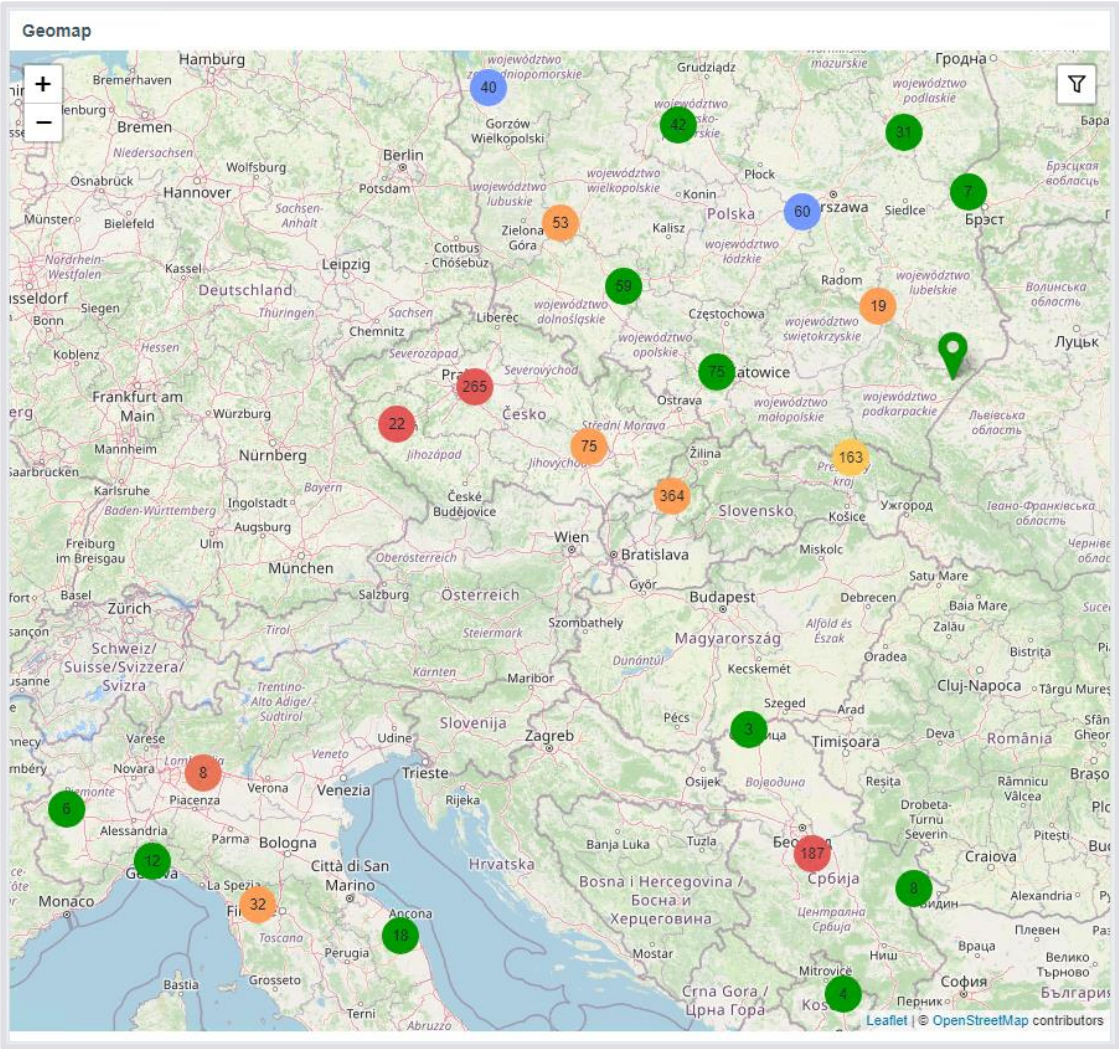


Use throttling

CHALLENGE 04

RESULT

Geomap widget



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MEET WITH US

ZABBIX
PREMIUM PARTNER

ZABBIX
CERTIFIED TRAINER

Tomáš
CEO

Tomáš
Developer

Alois
Technical consultant

Miroslav
Technical consultant

Marek
Technical consultant

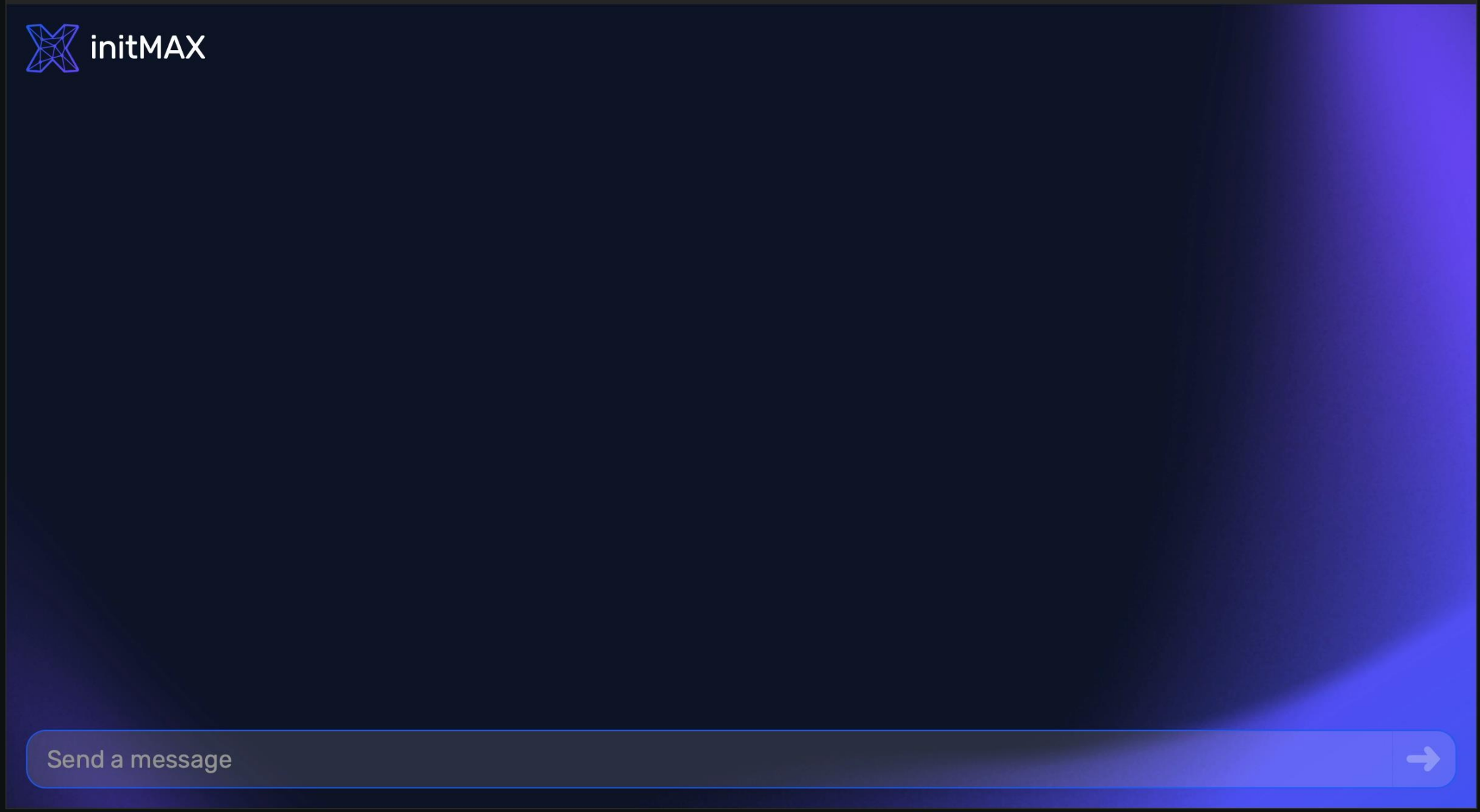
GIFTS

Same as last year, we've prepared a **few gifts** for you!

- A **free** template for monitoring **multiple certificates** on one host.
- Because we're fans of **AI**, we've prepared a new custom **ChatGPT widget** and we're giving it to you for free!

Dashboards
Monitoring
Services
Inventory
Reports
Data collection
Alerts
Users
Administration

OpenAI widget



EXAMPLES

Each of our examples is freely available in our GIT repository:
https://git.initmax.com/initMAX-Public

Source code is commented and provides examples.

- Template for multiple website certificates
- ChatGPT widget

- Widget Header
- Zabbix Compact Dashboard
- Enhanced Problems

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THANK YOU & SEE YOU ON SUMMIT

www.initmax.com

info@initmax.com

Visit our booth or explore hands on examples at our GIT on git.initmax.com