Monitoring Dynamic Environments

CHECKMK CONFERENCE #5 – MUNICH, APRIL 29, 2019
Agenda

1. THE WORLD IS BECOMING MORE DYNAMIC
2. HOW THE DCD WORKS
3. DCD FROM A USER PERSPECTIVE
4. TUNING THE DCD LATENCY
5. WHY DOES THIS MATTER?
The world is becoming dynamic

- Container technology adoption becoming mainstream
- Orchestration technology adoption ‘fuels’ dynamism
- Container density per node is increasing
- Average container lifetime is decreasing
THE DYNAMIC CONFIGURATION DEAMON

This is why...

We built the Dynamic Configuration Deamon (DCD)

Allows us to automatically adapt checkmk config also in very dynamic environments
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HOW IT WORKS

High level overview

DCD runs parallel to the CMC

CMC reloads configuration on the fly

Config changes don’t require restart

Remains operational & shifts config to new set-up
HOW IT WORKS

DCD in single-site monitoring

- DCD configured in WATO
- Collects information from source system (e.g. Kubernetes cluster)
- Activates config changes via the WATO API
Distributed DCD: 2-phased approach

**Phase 1** (on remote site)
- Collect information from source system (e.g. Kubernetes cluster)
- Produce data for Phase 2

**Phase 2** (on master site)
- Collect Phase 2 data from remote site
- Identify deltas & activate necessary changes
Core is configured by config „world“

- Config world ‘lives’ in the Core
- Foundation for Livestatus, checks, ...
When Core reloads, new config world is created

- When core reloads, new config world is created
- Basis for all new checks and livestatus connections
- Old world remains active, fades when all open queries have completed
HOW IT WORKS

After transition, single config remains

- After old world has faded, only remaining is new world

Active requests
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Setting up connections for the DCD

- Dynamic Config connections are set up under WATO ➔ „Hosts“
Setting up connections for the DCD

- Configuration in the checkmk GUI under „Hosts“ → „Dynamic Configuration“
Setting up connections for the DCD

- Set up a „New Connection“
- Each connection configurable to fit need
Configuring the DCD

- Configuration options

Sync interval:
- 0 days
- 0 hours
- 1 mins
- 0 secs

Create hosts in:
- Main directory

Discover services during creation:
- [x]

Host attributes to set:
- Data sources: SNMP
- No SNMP
- Add attribute

Delete vanished hosts:
- [ ]
- Filter by source host
- Filter by name
- Group activation for up to
- Never do activate changes in the following time ranges
Configuring the DCD

- Configuration options
  - Sync interval to read Piggy-Back data
Configuring the DCD

- Configuration options
  - Sync interval to read piggy-back data
  - Automated service discovery

Service discovery

Host attributes to set
- Data sources: SNMP
- No SNMP

Add attribute

Delete vanished hosts
- Filter by source host
- Filter by name
- Group activation for up to
- Never do activate changes in the following time ranges
Configuring the DCD

- **Configuration options**
  - Sync interval to read piggy-back data
  - Automated service discovery
  - Label-based filtering of specific data
Configuring the DCD

- Configuration options
  - Sync interval to read piggy-back data
  - Automated service discovery
  - Label-based filtering of specific data
  - And more...

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## Connections

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>TITLE</th>
<th>ID</th>
<th>SITE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### OK (Started at 2019-04-23 15:22:30, duration: 23.7 ms)

<table>
<thead>
<tr>
<th>STEP</th>
<th>MESSAGE</th>
<th>STATUS</th>
<th>DURATION</th>
<th>COMPLETION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1: Executing on 'heute'</td>
<td>Step has been finished</td>
<td>OK</td>
<td>622 μs</td>
<td>2019-04-23 15:22:30</td>
</tr>
<tr>
<td>Phase 2: Extract result</td>
<td>Step has been finished</td>
<td>OK</td>
<td>31.9 μs</td>
<td>2019-04-23 15:22:30</td>
</tr>
<tr>
<td>Phase 2: Fetch existing hosts</td>
<td>Step has been finished</td>
<td>OK</td>
<td>22.7 ms</td>
<td>2019-04-23 15:22:30</td>
</tr>
<tr>
<td>Phase 2: Activation</td>
<td>No activation needed</td>
<td>OK</td>
<td>2.86 μs</td>
<td>2019-04-23 15:22:30</td>
</tr>
</tbody>
</table>
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TUNING THE DCD LATENCY

Latency by „cascading“ of default sync intervals

WATO  Master  Remote  Special Agent  Source

Default

push  pull  1-60 sec  pull  1-60 sec  pull  1-60 sec

Sync intervals accumulate within remote setup (3-180 sec)
TUNING THE DCD LATENCY

Reduce latency by reducing sync intervals

WATO  Master  Remote  Special Agent  Source

Fast Sync

push  pull 1-5 sec  pull 1-5 sec  pull 1-5 sec

Sync intervals accumulate within remote setup (3-15 sec)
In extreme cases, further tuning possible

**TUNING THE DCD LATENCY**

Today

- **WATO** ➔ **Master** ➔ **Remote** ➔ **Special Agent** ➔ **Source**
  - Sync intervals accumulate within remote setup

Improvement

- **Push** from WATO to Master
- **Push** from Master to Remote
- **Push** from Remote to Special Agent
- **Pull** from Event-connector to Source
  - Event push
  - Real time checks
Here we have an Ask to make...

We need your help with large scale tests to identify if/where performance optimizations are needed most.
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WHY DOES THIS MATTER

Why should I care?

If I am not doing all this modern stuff – is this actually relevant for me?
**WHY DOES THIS MATTER**

A clear YES!

- All piggybacked services can already use DCD

- **Virtual machines:** Ask vCenter for VMs

- **Cloud Services:** Changes in resources

And many more...
WHY DOES THIS MATTER
And in the future even more!

- Because dynamic config will automate configuration for many different use cases

  - **Network scan:** Ask the network for hosts
  - **LDAP:** Ask for users or hosts
  - **CMDB:** Ask for changed config mgmt
Thank you!

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