

Kapitel 1

Orchestrierung

Orchestrierung (englisch orchestration, Instrumentierung, Inszenierung) ist das flexible Kombinieren mehrerer Services zu einer Komposition.

Beispiel: Konfiguration von Multitier App. * Installation von DB * Aufsetzen der Webserver * Datenbanken Aufsetzen * Webservices starten

Ansible kann auch zur Orchestrierung andere Konfigurationsmanagementtools einbinden.

1.1 Pre- und Post-task

Mit Post-task können wir z.B. einen Loadbalancer oder Nagios/Icinga einrichten.

Mit Pre-task kann der Loadbalancer bei Wartungsarbeiten bestimmte Webserver aus dem Verbund nehmen. Oder das Monitoring für bestimmte Wartungsarbeiten an Maschinen diese das Monitoring deaktivieren.

1.2 Delegation

Mit `delegate_to` können Aufgaben an andere Rechner weitergegeben werden.

```
- name: deregister web server from lb
  shell: < script to run on lb host >
  delegate_to: lbIf there areis more than one load balancers,
  anan inventory group can be iterated over as, follows:
- name: deregister web server from lb
  shell: < script to run on lb host >
  delegate_to: "{{ item }}"
  with_items: groups.lb
```

1.3 Rolling Updates

Damit nicht alle Webserver gleichzeitig ein Update durch Ansible ausführen, kann mit `serial` die Anzahl der ausführenden Rechner eingestellt werden.

1.4 Tests

Ab und an muss ein Rechner neu gebootet werden. Erst nach dem Neustart kann es weitergehen.

```
- name: wait for mysql to be up
wait_for: host=db.example.org port=3106 state=started
```

1.5 Tags

Mit Tags können Abschnitte aus einem Playbook gekennzeichnet werden. So können die Tags `install` dazu dienen Software zu installieren. Durch den Tag `start` werden die Abschnitte mit dem entsprechenden Tag ausgeführt.

```
ansible-playbook -i customhosts site.yml --tags install
```

oder

```
{ role: nginx, when: Ansible_os_family == 'Debian', tags: 'www' }
```

1.6 Limit

Mit Limit lassen sich Playbooks auf bestimmte Rechner bzw. Gruppen einschränken.

```
ansible-playbook -i customhosts site.yml --limit db
ansible-playbook -i customhosts site.yml --limit db,lb
ansible-playbook -i customhosts site.yml --limit 'all:!www:!db'
```

1.7 Tagging der Rollen

```
---
# filename: roles/haproxy/tasks/install.yml
- name: install haproxy
```

```

apt:
  name: "{{ haproxy['pkg'] }}"
  tags:
    - install
---
# filename: roles/haproxy/tasks/configure.yml
- name: create haproxy config
  template: src="haproxy.cfg.j2" dest="{{ haproxy['config']['cnfpath'] }}" mode=0644
  notify:
    - restart haproxy service
  tags:
    - configure
- name: enable haproxy
  template: src="haproxy.default.j2" dest=/etc/default/haproxy mode=0644
  notify:
    - restart haproxy service
  tags:
    - configure
---
# filename: roles/haproxy/tasks/service.yml
- name: start haproxy server
  service:
    name: "{{ haproxy['service'] }}"
    state: started
  tags:
    - start

```

Tagging der Rollenaufrufe

```

# filename: db.yml
roles:
  - { role: mysql, tags: 'mysql' }
#filename: www.yml
roles:
  - { role: nginx, when: Ansible_os_family == 'Debian', tags: ['www', 'nginx'] }
  - { role: php5-fpm, tags: ['www', 'php5-fpm'] }
  - { role: wordpress, tags: ['www', 'wordpress'] }
#filename: lb.yml
roles:
  - { role: haproxy, when: Ansible_os_family == 'Debian', tags: 'haproxy' }

```

Anzeigen der vergebenen Tags mit `ansible-playbook -i customhosts site.yml --list-tags`

1.8 Erstellen einer Orchestrierung für WP

1. Update von einen einzigen Webserver auf einmal.
2. Bevor der Update gefahren wird, soll der Webserver abgemeldet werden.
3. Rollen für wordpress ausführen, diese wären `nginx` `php5-fpm` und `wordpress`
4. Sicherstellen das der Webserver auf dem Port 80 läuft.
5. Den Webserver im haproxy rückmelden.

Datei `update.yml`

```
---
# Playbook for updating web server in batches
# filename: update.yml

- hosts: www
  remote_user: vagrant
  sudo: yes
  serial: 1

  pre_tasks:
    - name: deregister webserver from load balancer
      shell: echo "disable server fifanews/{{ ansible_hostname }}" |
        socat stdio /var/lib/haproxstats
      delegate_to: "{{ item }}"
      with_items: groups.lb

  roles:
    - { role: nginx, when: ansible_os_family == 'Debian' }
    - php5-fpm
    - wordpress

  post_tasks:
    - name: wait for web server to come up
      wait_for: host={{ inventory_hostname }} port=80 state=started

    - name: register webserver from load balancer
      shell: echo "enable server fifanews/{{ ansible_hostname }}" |
        socat stdio /var/lib/haproxstats
      delegate_to: "{{ item }}"
      with_items: groups.lb
```

1. Das Playbook läuft auf der Gruppe `www`.
2. Mit `serial` wird nur ein Rechner "gleichzeitig" abgearbeitet.
3. Mit `pre_tasks` wird der entsprechende Rechner beim haproxy abgemeldet.
Socket Cat <https://packages.debian.org/de/sid/socat>
4. Dann werden die Rollen ausgeführt.

5. Danach wird sichergestellt, dass der Server auf Port 80 läuft und danach beim haproxy angemeldet.

Kapitel 2

diff

```
diff -uNr -X ./diffignore ../B03800_09_code/projects/db.yml ./projects/
db.yml
--- ../B03800_09_code/projects/db.yml      2016-04-11  20:47:32.992187848
+0200
+++ ./projects/db.yml      2016-04-11  20:47:33.184187856 +0200
@@ -5,7 +5,7 @@
     remote_user: vagrant
     sudo: yes
     roles:
-    - { role: mysql }
+    - { role: mysql, tags: 'mysql' }
     vars:
       mysql:
         server: true
diff -uNr -X ./diffignore ../B03800_09_code/projects/lb.yml ./projects/
lb.yml
--- ../B03800_09_code/projects/lb.yml      2016-04-11  20:47:33.196187856
+0200
+++ ./projects/lb.yml      2016-04-11  20:47:33.180187855 +0200
@@ -4,6 +4,6 @@
     remote_user: vagrant
     sudo: yes
     roles:
-    - { role: haproxy, when: ansible_os_family == 'Debian' }
+    - { role: haproxy, when: ansible_os_family == 'Debian', tags: '
haproxy' }

diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/base/tasks/
main.yml ./projects/roles/base/tasks/main.yml
--- ../B03800_09_code/projects/roles/base/tasks/main.yml      2016-04-11
20:47:33.008187849 +0200
+++ ./projects/roles/base/tasks/main.yml      2016-04-11
20:47:33.028187849 +0200
@@ -4,6 +4,7 @@
```

```

    group: name=devops state=present
  - name: create devops user with admin previleges
    user: name=devops comment="Devops User" uid=2001 group=devops
+
  - name: install htop package
    action: apt name=htop state=present update_cache=yes
    when: ansible_os_family == 'Debian'
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/haproxy/tasks
    /configure.yml ../projects/roles/haproxy/tasks/configure.yml
--- ../B03800_09_code/projects/roles/haproxy/tasks/configure.yml
    2016-04-11 20:47:33.192187856 +0200
+++ ../projects/roles/haproxy/tasks/configure.yml      2016-04-11
    20:47:33.180187855 +0200
@@ -4,8 +4,13 @@
    template: src="haproxy.cfg.j2" dest="{{ haproxy['config']['cnfpath']
        }}" mode=0644
    notify:
      - restart haproxy service
+  tags:
+    - configure
+
  - name: enable haproxy
    template: src="haproxy.default.j2" dest=/etc/default/haproxy mode
        =0644
    notify:
      - restart haproxy service
+  tags:
+    - configure
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/haproxy/tasks
    /install.yml ../projects/roles/haproxy/tasks/install.yml
--- ../B03800_09_code/projects/roles/haproxy/tasks/install.yml
    2016-04-11 20:47:33.192187856 +0200
+++ ../projects/roles/haproxy/tasks/install.yml      2016-04-11
    20:47:33.180187855 +0200
@@ -3,3 +3,5 @@
  - name: install haproxy
    apt:
      name: "{{ haproxy['pkg'] }}"
+  tags:
+    - install
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/haproxy/tasks
    /service.yml ../projects/roles/haproxy/tasks/service.yml
--- ../B03800_09_code/projects/roles/haproxy/tasks/service.yml
    2016-04-11 20:47:33.192187856 +0200
+++ ../projects/roles/haproxy/tasks/service.yml      2016-04-11
    20:47:33.180187855 +0200
@@ -4,3 +4,5 @@
    service:
      name: "{{ haproxy['service'] }}"
      state: started

```

```

+   tags:
+   - start
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/haproxy/tasks
    /stop.yml ./projects/roles/haproxy/tasks/stop.yml
--- ../B03800_09_code/projects/roles/haproxy/tasks/stop.yml 1970-01-01
    01:00:00.000000000 +0100
+++ ./projects/roles/haproxy/tasks/stop.yml 2016-04-11
    20:47:33.180187855 +0200
@@ -0,0 +1,8 @@
+---
+# filename: roles/haproxy/tasks/stop.yml
+ - name: stop haproxy server
+   service:
+     name: "{{ haproxy['service'] }}"
+     state: stopped
+   tags:
+   - stop
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/haproxy/
    templates/haproxy.cfg.j2 ./projects/roles/haproxy/templates/haproxy.
    cfg.j2
--- ../B03800_09_code/projects/roles/haproxy/templates/haproxy.cfg.j2
    2016-04-11 20:47:33.192187856 +0200
+++ ./projects/roles/haproxy/templates/haproxy.cfg.j2 2016-04-11
    20:47:33.180187855 +0200
@@ -6,6 +6,7 @@
        user haproxy
        group haproxy
        daemon
+       stats socket /var/lib/haproxystats level admin

defaults
        log          global
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/mysql/tasks/
    configure.yml ./projects/roles/mysql/tasks/configure.yml
--- ../B03800_09_code/projects/roles/mysql/tasks/configure.yml
    2016-04-11 20:47:33.192187856 +0200
+++ ./projects/roles/mysql/tasks/configure.yml 2016-04-11
    20:47:33.176187855 +0200
@@ -4,12 +4,16 @@
        template: src="my.cnf.j2" dest="{{ mysql['config']['cnfpath'] }}"
        mode=0644
        notify:
        - restart mysql service
+   tags:
+   - configure

- name: create mysql databases
  mysql_db:
    name: "{{ item.key }}"
    state: "{{ item.value.state }}"
    with_dict: "{{ mysql['databases'] }}"

```



```

+   tags:
+     - configure

- name: create mysql users
  mysql_user:
@@ -19,6 +23,8 @@
    priv: "{{ item.value.priv }}"
    state: "{{ item.value.state }}"
    with_dict: "{{ mysql['users'] }}"
+   tags:
+     - configure

diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/mysql/tasks/
install_Debian.yml ./projects/roles/mysql/tasks/install_Debian.yml
--- ../B03800_09_code/projects/roles/mysql/tasks/install_Debian.yml
2016-04-11 20:47:33.192187856 +0200
+++ ./projects/roles/mysql/tasks/install_Debian.yml 2016-04-11
20:47:33.176187855 +0200
@@ -5,13 +5,19 @@
    apt:
      name: "{{ mysql['pkg']['client'] }}"
      update_cache: yes
+   tags:
+     - install

- name: install mysql server
  apt:
    name: "{{ mysql['pkg']['server'] }}"
    update_cache: yes
    when: mysql.server
+   tags:
+     - install

- name: install mysql python binding
  apt:
    name: "{{ mysql['pkg']['python'] }}"
+   tags:
+     - install
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/mysql/tasks/
install_RedHat.yml ./projects/roles/mysql/tasks/install_RedHat.yml
--- ../B03800_09_code/projects/roles/mysql/tasks/install_RedHat.yml
2016-04-11 20:47:33.192187856 +0200
+++ ./projects/roles/mysql/tasks/install_RedHat.yml 2016-04-11
20:47:33.176187855 +0200
@@ -4,7 +4,11 @@
  yum:
    name: "{{ mysql['pkg']['server'] }}"
    when: mysql.server
+   tags:

```

```

+   - install

- name: install mysql python binding
  yum:
    name: "{{ mysql['pkg']['python'] }}"
+   tags:
+   - install
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/mysql/tasks/
    service.yml ./projects/roles/mysql/tasks/service.yml
--- ../B03800_09_code/projects/roles/mysql/tasks/service.yml
    2016-04-11 20:47:33.192187856 +0200
+++ ./projects/roles/mysql/tasks/service.yml      2016-04-11
    20:47:33.176187855 +0200
@@ -4,3 +4,5 @@
    service:
      name: "{{ mysql['service'] }}"
      state: started
+   tags:
+   - start
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/mysql/tasks/
    stop.yml ./projects/roles/mysql/tasks/stop.yml
--- ../B03800_09_code/projects/roles/mysql/tasks/stop.yml    1970-01-01
    01:00:00.000000000 +0100
+++ ./projects/roles/mysql/tasks/stop.yml      2016-04-11
    20:47:33.176187855 +0200
@@ -0,0 +1,8 @@
+---
+# filename: roles/mysql/tasks/stop.yml
+ - name: stop mysql server
+   service:
+     name: "{{ mysql['service'] }}"
+     state: stopped
+   tags:
+   - stop
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/nginx/tasks/
    configure_ssl.yml ./projects/roles/nginx/tasks/configure_ssl.yml
--- ../B03800_09_code/projects/roles/nginx/tasks/configure_ssl.yml
    2016-04-11 20:47:33.188187856 +0200
+++ ./projects/roles/nginx/tasks/configure_ssl.yml  2016-04-11
    20:47:33.176187855 +0200
@@ -2,14 +2,22 @@
# filename: roles/nginx/tasks/configure_ssl.yml
- name: create ssl directory
  file: path="{{ nginx_ssl_path }}" state=directory owner=root group=
    root
+   tags:
+   - ssl

- name: add ssl key
  template: src=nginx.key.j2 dest="{{ nginx_ssl_path }}/nginx.key"
    mode=0644

```

```

+   tags:
+     - ssl

-   name: add ssl cert
    template: src=nginx.crt.j2 dest="{{ nginx_ssl_path }}/nginx.crt"
      mode=0644
+   tags:
+     - ssl

-   name: create ssl site configurations
    template: src=default_ssl.conf.j2 dest=/etc/nginx/conf.d/default_ssl
      .conf mode=0644
    notify:
      - restart nginx service
+   tags:
+     - ssl
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/nginx/tasks/
    configure.yml ../projects/roles/nginx/tasks/configure.yml
--- ../B03800_09_code/projects/roles/nginx/tasks/configure.yml
    2016-04-11 20:47:33.188187856 +0200
+++ ../projects/roles/nginx/tasks/configure.yml    2016-04-11
    20:47:33.176187855 +0200
@@ -3,10 +3,15 @@
    template: src=default.conf.j2 dest=/etc/nginx/conf.d/default.conf
      mode=0644
    notify:
      - restart nginx service
+   tags:
+     - configure
+
-   name: create home page for default site
    template:
      src: index.html.j2
      dest: /usr/share/nginx/html/index.html
+   tags:
+     - configure

-   name: create php virtual hosts
    template:
@@ -15,3 +20,5 @@
    with_dict: "{{ nginx['phpsites'] }}"
    notify:
      - restart nginx service
+   tags:
+     - configure
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/nginx/tasks/
    install.yml ../projects/roles/nginx/tasks/install.yml
--- ../B03800_09_code/projects/roles/nginx/tasks/install.yml
    2016-04-11 20:47:33.016187849 +0200
+++ ../projects/roles/nginx/tasks/install.yml      2016-04-11
    20:47:33.176187855 +0200

```

```

@@ -6,3 +6,5 @@
    - name: install nginx web server and ensure its at the latest version
      apt: name=nginx state=latest force=yes
+   tags:
+   - install
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/nginx/tasks/
    service.yml ./projects/roles/nginx/tasks/service.yml
--- ../B03800_09_code/projects/roles/nginx/tasks/service.yml
    2016-04-11 20:47:33.188187856 +0200
+++ ./projects/roles/nginx/tasks/service.yml      2016-04-11
    20:47:33.176187855 +0200
@@ -1,3 +1,5 @@
---
    - name: start nginx service
      service: name=nginx state=started
+   tags:
+   - start
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/nginx/tasks/
    stop.yml ./projects/roles/nginx/tasks/stop.yml
--- ../B03800_09_code/projects/roles/nginx/tasks/stop.yml      1970-01-01
    01:00:00.000000000 +0100
+++ ./projects/roles/nginx/tasks/stop.yml      2016-04-11
    20:47:33.176187855 +0200
@@ -0,0 +1,5 @@
+---
+ - name: stop nginx service
+   service: name=nginx state=stopped
+   tags:
+   - stop
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/php5-fpm/
    tasks/install.yml ./projects/roles/php5-fpm/tasks/install.yml
--- ../B03800_09_code/projects/roles/php5-fpm/tasks/install.yml
    2016-04-11 20:47:33.188187856 +0200
+++ ./projects/roles/php5-fpm/tasks/install.yml 2016-04-11
    20:47:33.172187855 +0200
@@ -5,4 +5,6 @@
    with_items: php5.packages
    notify:
      - restart php5-fpm service
+   tags:
+   - install

diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/php5-fpm/
    tasks/service.yml ./projects/roles/php5-fpm/tasks/service.yml
--- ../B03800_09_code/projects/roles/php5-fpm/tasks/service.yml
    2016-04-11 20:47:33.184187856 +0200
+++ ./projects/roles/php5-fpm/tasks/service.yml 2016-04-11
    20:47:33.172187855 +0200
@@ -4,3 +4,5 @@
    service:

```

```

        name: "{{ php5['service']['name'] }}"
        state: started
+   tags:
+   - start
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/php5-fpm/
    tasks/stop.yml ./projects/roles/php5-fpm/tasks/stop.yml
--- ../B03800_09_code/projects/roles/php5-fpm/tasks/stop.yml
    1970-01-01 01:00:00.000000000 +0100
+++ ./projects/roles/php5-fpm/tasks/stop.yml      2016-04-11
    20:47:33.172187855 +0200
@@ -0,0 +1,8 @@
+#filename: roles/php5-fpm/tasks/stop.yml
+# stop php5-fpm service
+- name: stop php5-fpm service
+   service:
+       name: "{{ php5['service']['name'] }}"
+       state: stopped
+   tags:
+   - stop
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/wordpress/
    tasks/configure.yml ./projects/roles/wordpress/tasks/configure.yml
--- ../B03800_09_code/projects/roles/wordpress/tasks/configure.yml
    2016-04-11 20:47:33.020187849 +0200
+++ ./projects/roles/wordpress/tasks/configure.yml 2016-04-11
    20:47:33.060187851 +0200
@@ -8,6 +8,8 @@
        owner: "{{ wp_user }}"
        group: "{{ wp_group }}"
        recurse: true
+   tags:
+   - configure

-   name: get unique salt for wordpress
    # runs a command locally and registers the results in the
@@ -15,6 +17,8 @@
    # additional security. This variable will be used inside a template
        this time.
        local_action: command curl https://api.wordpress.org/secret-key
            /1.1/salt
        register: wp_salt
+   tags:
+   - configure

-   name: copy wordpress template
    # generate a Jinja2 template and copy it over to the target
@@ -23,4 +27,5 @@
        src: wp-config.php.j2
        dest: "{{ wp_docroot }}/{{ wp_sitedir }}/wp-config.php"
        mode: 0644
-
\ Kein Zeilenumbruch am Dateiende.

```

```

+   tags:
+   - configure
\ Kein Zeilenumbruch am Dateende.
diff -uNr -X ./diffignore ../B03800_09_code/projects/roles/wordpress/
    tasks/install.yml ./projects/roles/wordpress/tasks/install.yml
--- ../B03800_09_code/projects/roles/wordpress/tasks/install.yml
    2016-04-11 20:47:33.020187849 +0200
+++ ./projects/roles/wordpress/tasks/install.yml    2016-04-11
    20:47:33.072187851 +0200
@@ -19,6 +19,8 @@
    #           stdout_lines: This is the output line by line
    #           stderr: These state the errors, if any
    register: wp_download
+   tags:
+   - install

    - name: create nginx docroot
      file:
@@ -26,6 +28,8 @@
      state: directory
      owner: "{{ wp_user }}"
      group: "{{ wp_group }}"
+   tags:
+   - install

    - name: extract wordpress
      # Shell Modul wegen der && Verknüpfung
diff -uNr -X ./diffignore ../B03800_09_code/projects/update.yml ./
    projects/update.yml
--- ../B03800_09_code/projects/update.yml    1970-01-01
    01:00:00.000000000 +0100
+++ ./projects/update.yml    2016-04-11 20:47:33.172187855 +0200
@@ -0,0 +1,29 @@
+---
+# Playbook for updating web server in batches
+# filename: update.yml
+
+- hosts: www
+  remote_user: vagrant
+  sudo: yes
+  serial: 1
+
+  pre_tasks:
+  - name: deregister webserver from load balancer
+    shell: echo "disable server fifanews/{{ ansible_hostname }}" |
      socat stdio /var/lib/haproxystats
+    delegate_to: "{{ item }}"
+    with_items: groups.lb
+
+  roles:
+  - { role: nginx, when: ansible_os_family == 'Debian' }

```

```

+     - php5-fpm
+     - wordpress
+
+   post_tasks:
+     - name: wait for web server to come up
+       wait_for: host={{ inventory_hostname }} port=80 state=started
+
+     - name: register webserver from load balancer
+       shell: echo "enable server fifanews/{{ ansible_hostname }}" |
+       socat stdio /var/lib/haproxystats
+       delegate_to: "{{ item }}"
+       with_items: groups.lb
+
diff -uNr -X ./diffignore ../B03800_09_code/projects/www.yml ./projects/
www.yml
--- ../B03800_09_code/projects/www.yml    2016-04-11  20:47:33.184187856
+0200
+++ ./projects/www.yml    2016-04-11  20:47:33.172187855  +0200
@@ -5,9 +5,9 @@
   pre_tasks:
     - shell: echo 'I':" Beginning to configure web server..'
   roles:
-   - { role: nginx, when: ansible_os_family == 'Debian' }
-   - php5-fpm
-   - wordpress
+   - { role: nginx, when: ansible_os_family == 'Debian', tags: [ 'www
+', 'nginx' ] }
+   - { role: php5-fpm, tags: [ 'www', 'php5-fpm' ] }
+   - { role: wordpress, tags: [ 'www', 'wordpress' ] }
   post_tasks:
     - shell: echo 'I':" Done configuring nginx web server...'

```