UNIVERSIDADE ESTADUAL DO TOCANTINS
SISTEMAS DE INFORMAÇÃO – CÂMPUS GRACIOSA

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DISCIPLINA: COMPUTAÇÃO ORIENTADA A SERVIÇOS

TRABALHO A1 - Instalação e configuração de Servidores WEB com Ansible

RTP

1. Instalar e configurar o NTP em 03 Servidores Linux.

- Instalando NTP com comando de: **sudo apt install ntp**
- Abrindo arquivo de configuração: **sudo nano /etc/ntp.conf**
- Arquivo de configuração de servidores NTP para os IP's de máquinas AWS:

```
  GNU nano 7.2                                    /etc/ntp.conf
# Use servers from the NTP Pool Project
pool 0.ubuntu.pool.ntp.org iburst
pool 1.ubuntu.pool.ntp.org iburst
pool 2.ubuntu.pool.ntp.org iburst
pool 3.ubuntu.pool.ntp.org iburst

# Use the other EC2 instances as NTP sources
server ec2-18-189-28-27.us-east-2.compute.amazonaws.com iburst
server ec2-3-136-154-173.us-east-2.compute.amazonaws.com iburst
```

2. Verificar se o RTP está ativo e executado.

- Reiniciando serviço NTP depois de configuração, e verificando status.
  Status está constando ativo e rodando para os servidores:

```
ubuntu@ip-172-31-34-248:~$ sudo systemctl daemon-reload
ubuntu@ip-172-31-34-248:~$ sudo systemctl restart ntp
ubuntu@ip-172-31-34-248:~$ sudo systemctl status ntp
● ntpsec.service - Network Time Service
     Loaded: loaded (/usr/lib/systemd/system/ntpsec.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-10-08 00:29:00 UTC; 5s ago
       Docs: man:ntpd(8)
    Process: 1666 ExecStart=/usr/libexec/ntpsec/ntp-systemd-wrapper (code=exited, status=0/SUCCESS)
   Main PID: 1669 (ntpd)
      Tasks: 1 (limit: 1130)
     Memory: 10.5M (peak: 10.8M)
        CPU: 58ms
     CGroup: /system.slice/ntpsec.service
             └─1669 /usr/sbin/ntpd -p /run/ntpd.pid -c /etc/ntpsec/ntp.conf -g -N -u ntpsec:ntpsec

Oct 08 00:29:03 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 2604:a880:800:10::70f:b001
Oct 08 00:29:03 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 2a01:7e03::f03c:92ff:fe8c:f7c9
Oct 08 00:29:03 ip-172-31-34-248 ntpd[1669]: DNS: dns_take_status: 2.ubuntu.pool.ntp.org=>good, 8
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: dns_probe: 3.ubuntu.pool.ntp.org, cast_flags:8, flags:101
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: dns_check: processing 3.ubuntu.pool.ntp.org, 8, 101
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 96.60.160.227
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 23.155.40.38
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 45.61.187.39
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: Pool taking: 69.164.213.136
Oct 08 00:29:04 ip-172-31-34-248 ntpd[1669]: DNS: dns_take_status: 3.ubuntu.pool.ntp.org=>good, 8
```

3. Buscando variável para configuração de relógio das máquinas:

```
ubuntu@ip-172-31-34-248:~$ ntpq -c rl
associd=0 status=0015 leap_none, sync_unspec, 1 event, clock_sync,
leap=00, stratum=2, precision=-21, rootdelay=15.695, rootdisp=3.218, refid=99.28.14.242,
reftime=eaaefd26.6cdf0fce 2024-10-08T00:36:54.425Z, tc=6, peer=17778, offset=0.534671, frequency=-4.096572,
sys_jitter=2.645613, clk_jitter=1.033303, clock=eaaefd4a.c42a2aad 2024-10-08T00:37:30.766Z, processor="x86_64",
system="Linux/6.8.0-1016-aws", version="ntpd ntpsec-1.2.2", clk_wander=0.0, tai=37, leapsec="2017-01-01T00:00Z",
expire="2024-12-28T00:00Z", mintc=0
```

4. Fazendo arquivo de backup de configuração NTP:

```
ubuntu@ip-172-31-34-248:~$ sudo cp -p /etc/ntp.conf /etc/ntp.conf.bkp
ubuntu@ip-172-31-34-248:~$ ls -l /etc/ntp.conf.bkp
-rw-r--r-- 1 root root 349 Oct  8 00:28 /etc/ntp.conf.bkp
```

5. Ajustando o sistema ao fuso horário América/São Paulo:

- Comando para setar o horário: **sudo timedatectl set-timezone America/Sao_Paulo**
- Comando: **sudo ntpq -p**

  Indica que o sistema está ajustado ao fuso horário de America/Sao_Paulo
  Mostra que o servidor está sincronizando com várias fontes NTP
  O servidor ntp0.alb1.inoc.net está sendo usado como a fonte principal
  O sistema está sincronizado com servidores NTP e o horário está ajustado para o fuso de Brasília

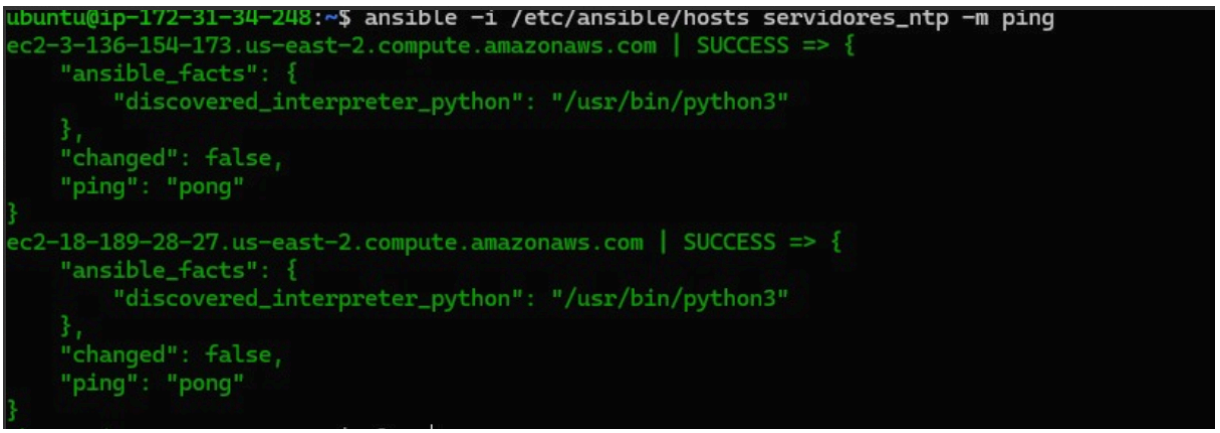
```
ubuntu@ip-172-31-34-248:~$ date
Mon Oct  7 21:54:39 -03 2024
ubuntu@ip-172-31-34-248:~$ sudo ntpq -p
     remote                                refid      st t when poll reach   delay   offset   jitter
==============================================================================================================
 0.ubuntu.pool.ntp.org                    .POOL.          16 p    -  256    0    0.0000    0.0000   0.0005
 1.ubuntu.pool.ntp.org                    .POOL.          16 p    -  256    0    0.0000    0.0000   0.0005
 2.ubuntu.pool.ntp.org                    .POOL.          16 p    -  256    0    0.0000    0.0000   0.0005
 3.ubuntu.pool.ntp.org                    .POOL.          16 p    -  256    0    0.0000    0.0000   0.0005
+prod-ntp-4.ntp4.ps5.canonical.com         183.160.133.132  2 u   63   64   17   89.3636   -0.7861   2.2247
+edge.txryan.com                           134.71.66.21     2 u   60   64   17   17.8507    1.7527   2.8818
#74.208.25.46                             84.126.140.179   2 u   62   64   17   20.7001   -9.1533   2.1030
+74.208.117.38                            216.239.35.4     2 u   55   64   17   16.3636   -2.4744   2.8347
-ip212-227-240-160.pbiaas.com             216.239.35.12    2 u   62   64   17   59.5416   -2.0296   2.7928
*ntp0.alb1.inoc.net                       172.21.4.40      2 u   61   64   17   21.0442   -3.2616   2.7013
#kjsl-fmt2-net.fmt2.kjsl.com              177.115.13.154   2 u   59   64   17   71.4547    2.7564   2.6011
-clock.nyc.he.net                         66.220.9.122     2 u   56   64   17   16.6161   -3.9842   2.6336
+y.ns.gin.ntt.net                         129.250.35.222   2 u   55   64   17   10.0556   -2.2541   2.5167
#europa.ellipse.net                       69.89.207.99     2 u   55   64   17   30.1633    4.1226   2.4580
#44.190.5.123                             17.253.4.125     2 u   57   64   17   71.1147    2.5164   2.4881
+time.richiemcintosh.com                  47.187.174.51    2 u   57   64   17   28.6518   -1.0760   2.4894
 2605:9880:200:600:35:ddc:8154:8          .INIT.          16 u    -   64    0    0.0000    0.0000   0.0005
 time4.lshiy.com                          .INIT.          16 u    -   64    0    0.0000    0.0000   0.0005
 2607:f298:5:101d:f816:3eff:fefd:8817     .INIT.          16 u    -   64    0    0.0000    0.0000   0.0005
 2603:c020:0:8369:607:e532:d534:7109      .INIT.          16 u    -   64    0    0.0000    0.0000   0.0005
+time.cloudflare.com                       10.185.8.6       3 u   56   64   17    1.5201    0.2394   2.2618
-lax.caltick.net                          151.47.50.108    2 u   53   64   17   57.0218   -5.1799   2.2555
#ip229.ip-51-81-226.us                    192.168.10.254   2 u   61   64   17   56.4556   -0.8959   2.2065
-103.152.113.66                           80.72.67.48      3 u   59   64   17   61.3723   -6.2069   2.2948
```

- Sobrescrever arquivos com chaves novas NTP

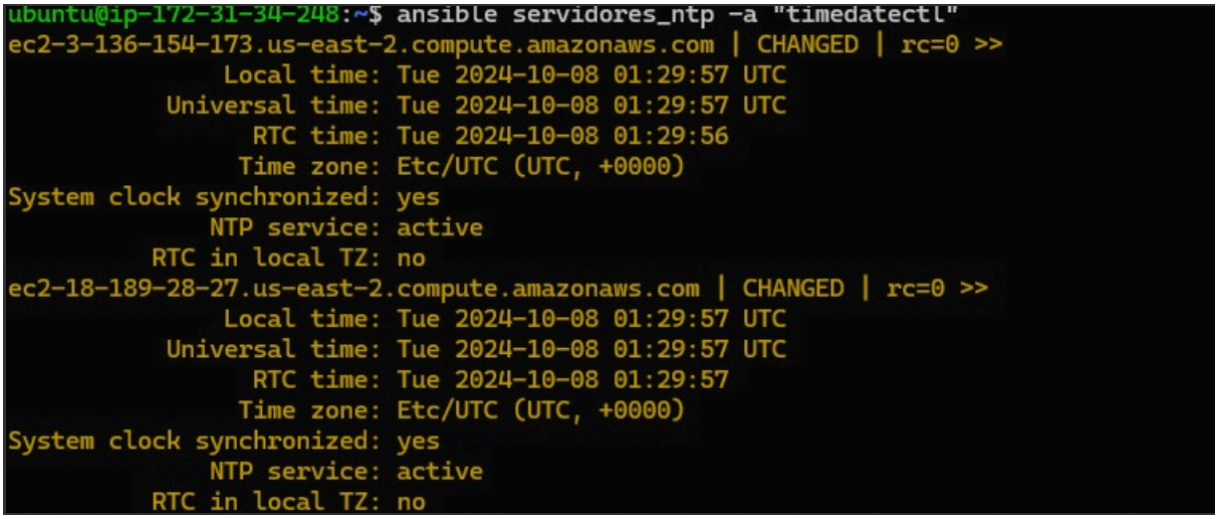
```
ubuntu@ip-172-31-34-248:/etc/ansible$ echo "[servidores_ntp]
ec2-18-189-28-27.us-east-2.compute.amazonaws.com ansible_ssh_private_key_file=/home/ubuntu/ServidorNginx01.pem
ec2-3-136-154-173.us-east-2.compute.amazonaws.com ansible_ssh_private_key_file=/home/ubuntu/ServidorNginx02.pem

[all:vars]
ansible_user=ubuntu
" | sudo tee /etc/ansible/hosts > /dev/null
```

- Testando conexão com servidores novamente, via ping



- Buscando qual o horário de cada máquina conectada, por padrão



- Arquivo de playbook para configuração automatizada das máquinas:

GNU nano 7.2 playbook-ntp.yml

```yaml
- hosts: servidores_ntp
  become: yes
  tasks:
    - name: Instalar o NTP
      apt:
        name: ntp
        state: present

    - name: Configurar o fuso horário para America/Sao_Paulo
      timezone:
        name: America/Sao_Paulo

    - name: Criar o arquivo /etc/ntp.conf com a configuração básica se ele não existir
      copy:
        content: |
          # Use servers from the NTP Pool Project
          pool 0.ubuntu.pool.ntp.org iburst
          pool 1.ubuntu.pool.ntp.org iburst
          pool 2.ubuntu.pool.ntp.org iburst
          pool 3.ubuntu.pool.ntp.org iburst

          # Use the other EC2 instances as NTP sources
          server ec2-18-189-28-27.us-east-2.compute.amazonaws.com iburst
          server ec2-3-136-154-173.us-east-2.compute.amazonaws.com iburst
        dest: /etc/ntp.conf
        owner: root
        group: root
        mode: '0644'

    - name: Fazer backup do arquivo de configuração NTP
      copy:
        src: /etc/ntp.conf
        dest: /etc/ntp.conf.bkp
        backup: yes

    - name: Atualizar o arquivo de configuração do NTP
      lineinfile:
        path: /etc/ntp.conf
        regexp: '^pool'
        line: |
          pool 0.ubuntu.pool.ntp.org iburst
          pool 1.ubuntu.pool.ntp.org iburst
          pool 2.ubuntu.pool.ntp.org iburst
          pool 3.ubuntu.pool.ntp.org iburst

    - name: Reiniciar o serviço NTP
      service:
        name: ntp
        state: restarted

    - name: Verificar o status do NTP
      command: ntpq -p
      register: ntp_status

    - name: Exibir o status do NTP
      debug:
        var: ntp_status.stdout
```

- Resposta ao rodar arquivo playbook-ntp para as máquinas:

```
ubuntu@ip-172-31-34-248:~$ ansible-playbook playbook-ntp.yml

PLAY [servidores_ntp] ***********************************************************************************************************************

TASK [Gathering Facts] **********************************************************************************************************************
ok: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
ok: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Instalar o NTP] ***********************************************************************************************************************
ok: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
ok: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Configurar o fuso horário para America/Sao_Paulo] *************************************************************************************
ok: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
ok: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Criar o arquivo /etc/ntp.conf com a configuração básica se ele não existir] ***********************************************************
changed: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
changed: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Fazer backup do arquivo de configuração NTP] ******************************************************************************************
ok: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
ok: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Atualizar o arquivo de configuração do NTP] *******************************************************************************************
changed: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
changed: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Reiniciar o serviço NTP] **************************************************************************************************************
changed: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
changed: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Verificar o status do NTP] ************************************************************************************************************
changed: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com]
changed: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com]

TASK [Exibir o status do NTP] ***************************************************************************************************************
ok: [ec2-3-136-154-173.us-east-2.compute.amazonaws.com] => {
    "ntp_status.stdout": "     remote           refid      st t when poll reach   delay   offset   jitter\n==============================\n 0.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n 1.ubuntu.pool.
n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n 2.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0
005\n 3.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n ntp.ubuntu.com  .DNS.           16 u    -   64    0    0
.0000   0.0000   0.0005"
}
ok: [ec2-18-189-28-27.us-east-2.compute.amazonaws.com] => {
    "ntp_status.stdout": "     remote           refid      st t when poll reach   delay   offset   jitter\n==============================\n 0.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n 1.ubuntu.pool.
n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n 2.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0
005\n 3.ubuntu.pool.n .POOL.          16 p    -   64    0    0.0000   0.0000   0.0005\n ntp.ubuntu.com  .DNS.           16 u    -   64    0    0
.0000   0.0000   0.0005"
}

PLAY RECAP **********************************************************************************************************************************
ec2-18-189-28-27.us-east-2.compute.amazonaws.com : ok=9    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
ec2-3-136-154-173.us-east-2.compute.amazonaws.com : ok=9    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

LAMP

6. Instalar e configurar Apache, Mariadb e PHP nos 03 servidores.

- Criando playbook-lamp para a configuração e instalação de tudo que for preciso na três máquinas, primeiramente criando repositório para os arquivos na máquina principal,
- Comando: **mkdir -p /home/ubuntu/app/**
- Arquivos criados :

```
ubuntu@ip-172-31-34-248:~$ ls /home/ubuntu/app/
estilo.css  index.html  index.php
```

- Criando arquivo playbook-lamp.yml para configuração das máquinas:

```
 GNU nano 7.2                                playbook-lamp.yml
---
- hosts: servidores_ntp
  become: yes
  tasks:
    # 1. Instalar Apache, MariaDB e PHP
    - name: Instalar o Apache, MariaDB e PHP
      apt:
        name: "{{ item }}"
        state: present
        update_cache: yes
      loop:
        - apache2
        - mariadb-server
        - php
        - php-mysql

    # 2. Verificar se o serviço Apache está rodando
    - name: Verificar se o serviço Apache está rodando
      service:
        name: apache2
        state: started
        enabled: true

    # 3. Criar diretório para a aplicação
    - name: Criar diretório /var/www/html/app no servidor
      file:
        path: /var/www/html/app
        state: directory
        owner: www-data
        group: www-data
        mode: '0755'

    # 4. Copiar arquivo index.php para o servidor
    - name: Copiar arquivo index.php
      copy:
        src: /home/ubuntu/app/index.php    # Caminho no Control Node (local)
        dest: /var/www/html/app/index.php  # Caminho de destino no servidor
        owner: www-data
        group: www-data
        mode: '0644'

    # 5. Copiar arquivo index.html para o servidor
    - name: Copiar arquivo index.html
      copy:
        src: /home/ubuntu/app/index.html   # Caminho no Control Node (local)
        dest: /var/www/html/app/index.html # Caminho de destino no servidor
        owner: www-data
        group: www-data
        mode: '0644'

    # 6. Copiar arquivo estilo.css para o servidor
    - name: Copiar arquivo estilo.css
      copy:
        src: /home/ubuntu/app/estilo.css   # Caminho no Control Node (local)
        dest: /var/www/html/app/estilo.css # Caminho de destino no servidor
        owner: www-data
        group: www-data
        mode: '0644'

    # 7. Reiniciar o Apache para garantir que ele pode servir os arquivos
    - name: Reiniciar o Apache
      service:
        name: apache2
        state: restarted
```

- Rodando e resposta positiva para as tasks do playbook nas máquinas: