Forcepoint Behavioral Analyitcs

INSTALL GUIDE FOR VERSION 3.3.3

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Document Conventions

The following typographic conventions are used in this guide:

Typography

Format	Description
Bold font	Used to identify Graphical User Interface (GUI) elements, buttons, fields, and list labels. Example: Type your IP address in the **ip address** field and click **OK**.
Italic font	Used to identify book titles or words that require emphasis. Example: Read the *User's Guide.*
Monospaced font	Used to identify names of commands, files, and directories. Example: Use the `ls -a` command to list all files.
Monospaced bold font	When inline, this is used to identify text that users need to type. Example: Type `SYSTEMHIGH` in the **Network** field.
Shaded monospaced font	Used to identify screen output. Example: A network device must exist; otherwise, the following warning message displays `Warning: device [DEVICE] is not a valid network device`
Shaded monospaced bold font	Used to identify text that users need to type. Example: Specify your network configuration. Type: `$ sudo ip addr show`

This guide makes use of the following elements:

Note
Contains important information, suggestions or references to material covered elsewhere in the guide.

Tip
Provides helpful suggestions or alternative methods to perform a task.

Warning
Alerts you to an activity that may cause permanent loss of data or product functionality. Failure to heed a warning could result in permanent consequences to your data or system.

Caution
Alerts you to anything that could result in a security breach or temporary loss of data or product functionality. You may also see a caution when a particular action may have an adverse impact that is not readily apparent.

Important
Highlights critical tasks, information or actions that may be damaging to your system or security.

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Installation Overview

This Forcepoint Behavioral Analytics (FBA) Installation manual guides technical FBA users through a complete installation of an FBA deployment. This guide includes step-by-step instructions for installing FBA via Ansible and Jenkins. This document covers system architecture, required software installation tools, and finally a step-by-step guide for a complete install.

The System Architecture section shows how data moves throughout software components, as well as how 3rd party software is used for key front- and back-end functionalities.

The Installation Components section elaborates on important pre-installation topics. In preparation for the initial installation setup, we discuss high-level topics regarding Jenkins and Ansible - the tools FBA utilizes to facilitate installation commands. Additionally, we strongly recommend following the Forcepoint Behavioral Analytics Hardening Guide (available through Professional Services) to ensure the system is set up with security best practices.

Although Jenkins is pre-configured at the time of install, we include Jenkins Setup information and important access and directory location information for a holistic understanding of this key installation facilitator.

To conclude this document, we include step-by-step instructions for using Ansible to initialize the Jenkins CI/CD server to install each required software component.

An addendum is included for additional components which can optionally be installed.

Go to the Downloads page and navigate to Forcepoint Behavioral Analytics to find the downloads for Forcepoint Behavioral Analytics.

Platform Overview
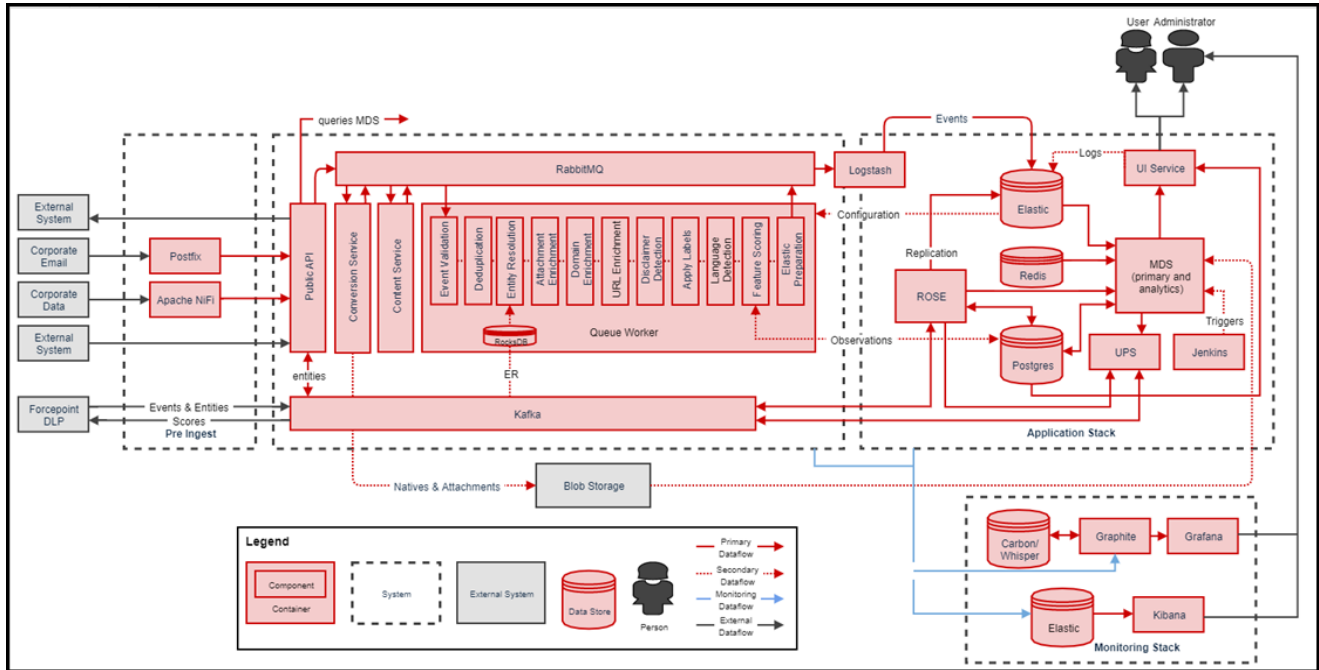
COMPONENT ARCHITECTURE

Figure 1: Component Architecture
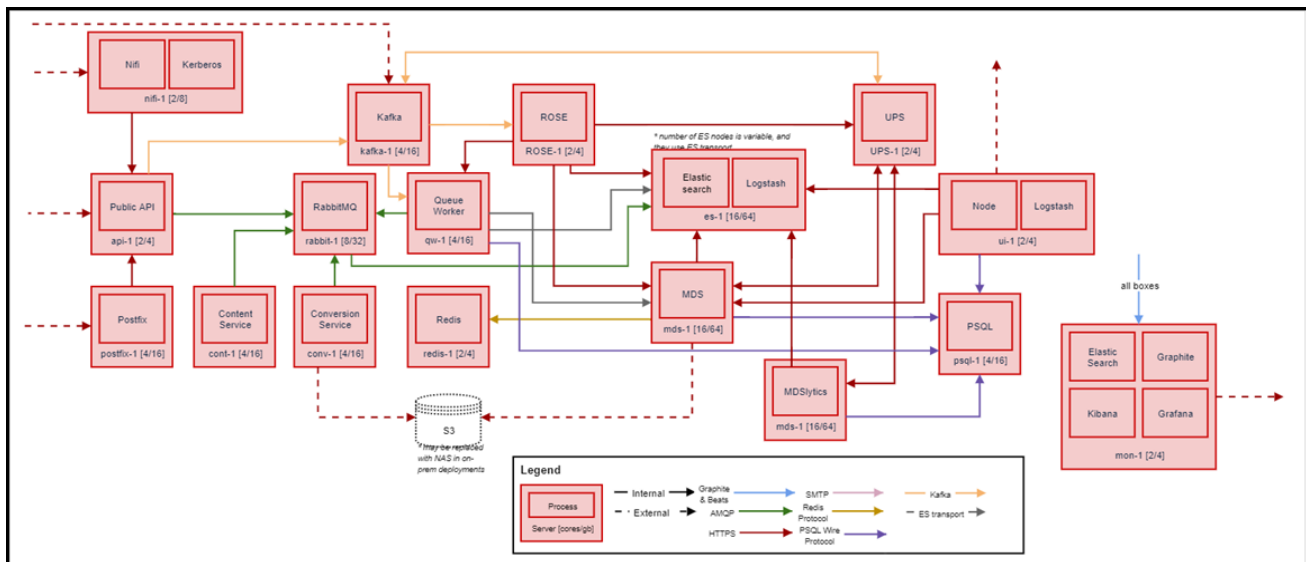
PHYSICAL ARCHITECTURE

Figure 2: Physical Architecture

Installation Components

○ **Host OS**

Forcepoint requires a RedHat 7 host-based Operating System for the FBA platform to be installed. CentOS 7 (minimal) is the recommended OS to be used. Please note, other heavier install media can be used, but not necessary or recommended. At the time of publication, the latest version is CentOS 7.9. CentOS 6 is not supported, as it has known incompatibilities with our installation process and may introduce bugs into the FBA product due to OS differences.

○ **Security**

Forcepoint recommends using commonly accepted network security practices to restrict access to the FBA infrastructure. For instance, creating rules in IPTables, or implementing a network firewall that only allows the access defined in the ports list below.

○ **Port Map**

Table 1.1. Port Map

Service Name	Host	Port	Consumers
RO-API	api	9000	External Data Sources, RabbitMQ
RO-API	api	9001	Administrator Workstation
RO-Conv	conv	9080	RabbitMQ
RO-Conv	conv	9081	Administrator Workstation
RO-Cont	cont	9700	RabbitMQ, ES
RabbitMQ	rabbit	4369	RabbitMQ, (internal port)
RabbitMQ	rabbit	15672	Administrator Workstation
ro-qw	qw	9090	RabbitMQ
ro-qw	qw	9091	Adminstrator Workstation
redis	redis	6379	UI
UI	ui	80/443	Users
Elasticsearch	es	9200	UI, Jenkins, ES, MDS, API, Conf, QW
Elasticsearch	es	9201	Administrator Workstation
Elasticsearch	ew	9300-9400	Elasticsearch
ro-mds	mds, mdslytics	8080	UI, Jenkins, MDS
ro-mds	mds, mdslytics	8081	Administrator Workstation

Service Name	Host	Port	Consumers
ro-rose	rose	9500	API, Postgres, Nifi, QW, UPS
ro-rose	rose	9501	Administrator Workstation
ro-ups	ups	9600	MDS
ro-ups	ups	9601	Administrator Workstation
OpenVPN	vpn	1194	External Clients

Installation Requirements

The FBA installation is Ansible based and requires Ansible version 2.5.8.0. No action is required as the installer has prerequisites packaged. Our current internal version is stable/3.7 in the Ansible git repository. The most recent stable version of this must be available to properly deploy the FBA platform. This Ansible code is distributed via the offline-installer. Please contact Forcepoint Support for further information.

INSTALLATION FACILITATORS

Ansible

Ansible is an IT automation tool that can configure systems, deploy software, and orchestrate more advanced IT tasks such as continuous deployments or zero downtime rolling updates. Ansible playbooks are used to incrementally install the separate components of a Forcepoint Behavioral Analytics instance.

File Format: YAML

- Ansible uses YAML because it is easier for humans to read and write than other common data formats, like XML or JSON. Further, there are libraries available in most programming languages for working with YAML.

Playbooks

- Playbooks are the basis for really simple configuration management and multimachine deployment system that is well suited to deploy complex applications.

- Playbooks can declare configurations, and they can also orchestrate steps of any manual ordered process, even as different steps must bounce back and forth between sets of machines in particular orders. They can launch tasks synchronously or asynchronously.

- Individual "Tasks" Make Up a role or playbook. A "Playbook" is comprised of tasks and roles.

```
- hosts: webservers

remote_user: root

tasks:

- name: ensure apache is at the latest version
```

```
yum: name=httpd state=latest

- name: write the apache config file

template: src=/srv/httpd.j2 dest=/etc/httpd.conf
```

- hosts: databases

```
remote_user: root


tasks:
- name: ensure postgresql is at the latest version
yum: name=postgresql state=latest
- name: ensure that postgresql is started
service: name=postgresql state=started
```

Jenkins

Jenkins is an open-source automation server that helps to automate the non-human part of continuous delivery. This is the primary way in which Forcepoint installs the Forcepoint Behavioral Analytics software.

Installation Procedures

THINGS TO CONSIDER

- Infrastructure must be provisioned beforehand.
  - Including:
    - All hosts as needed for the size of the deployment.
      - Every major component in the Forcepoint Behavioral Analytics tech stack runs on its own host.
    - Appropriate networking considerations.
    - Local disk storage.
    - NFS shared storage or S3 (dependent on on-prem vs AWS deployment type).
- Disabling swap on all hosts is highly recommended, and at a minimum, this needs to be done on the ElasticSearch.
  - Can be done by simply running 'swapoff -a' on all nodes and then removing any mount points for swap in `/etc/fstab`.

- If installing under VMware install the package open-vm-tools for better VM support.

- Python version 2.7 is required on all hosts. Version 2.7.5 is included in the latest version of the installer at the time of publication.

- All hosts must have SSH enabled and reachable from the provisioning Ansible host (Jenkins) via /etc/hosts or DNS.

- Our install and configuration is Ansible based.

  - `/etc/ansible/hosts` file must be accurate.

  - `/etc/ansible/group_vars/all` must be accurate and tailored to any site-specific overrides if necessary.

  - Host machine running ansible playbooks must have ssh access to all hosts in the `/etc/ansible/hosts` inventory file.

- All commands are assumed to be run on a fully updated CentOS 7 or RHEL 7 host.

- Escalated privileges are required for installation and runtime.

  - Installation should be done using the sudo user and **not** the root user.

  - Depending on security policies, for ease, the sudoers file should be updated to allow for passwordless sudo usage.

- The Jenkins host will be where you perform all actions from here on.

- The Jenkins server is initialized and after, the Forcepoint Behavioral Analytics platform is deployed via the Continuous Delivery server.

  > **Tip**
  >
  > Wget is a useful tool not included in the minimal install that can be used to download the installer file.
  >
  > To install:
  >
  > ```
  > sudo yum install wget
  > ```

DOWNLOAD AND RUN THE FORCEPOINT BEHAVIORAL ANALYTICS INSTALLER

1. Retrieve Forcepoint Behavioral Analytics installer from support.

   a. Go to **https://support.forcepoint.com**

2. Set Forcepoint Behavioral Analytics installer to be executable.

   a. Open a terminal window and run the following command:

   ```
   sudo chmod +x Forcepoint-UEBA-3.3.x-CentOS-7.bin
   ```

3. Extract Forcepoint behavioral analytics installer.

   a. Run the follwing command in the terminal window:

   ```
   sudo bash Forcepoint-UEBA-3.3.x-CentOS-7.bin
   ```

CREATE AND CONFIGURE THE HOSTS AND GROUP/VARS/ALL FILES

There are three system config files that **MUST** be created with care in order for the install and runtime processes to work successfully:

1. `/etc/ansible/hosts`

   Use: Config file used by Ansible for a list of hosts and groupings of hosts being managed.

2. `/etc/hosts`

   Use: Operating system file that translates hostnames or domain names to IP addresses.

3. `/etc/ansible/group_vars/all`

   a. Use: The top-level setting of variables used in the Ansible playbooks.

   b. Example Versions:

      i. `all.aws.example` for AWS installations.

      ii. `all.on-prem.example` for On-Prem installations.

   ➡️ **Tip**

   It is highly recommended to use the example files provided as the starting point for these three files. Example files for each of these files are available under:

   `/usr/share/ro-ansible/sysconfdir/`

1. Prepare for file creation.

   Create the necessary file path by running the following command in a terminal window:

   ```
   mkdir -p /etc/ansible/group_vars
   ```

2. Create and configure `/etc/ansible/hosts`

   The following command will create the template: `/etc/ansible/hosts` file, do a search and replace command using `sed`, and copy the updated file to the correct location. The find and replace command (sed) will change 'xxxxx' to the text that is in the `change_me` field.

   ⚠️ **Important**

   Make sure to change `change_me` in the example below before running the command. It will be visible to users, use an abbreviation of the customer's name or something else that will be intuitive.

✅ **Note**

This example file is based on a minimal deployment and will need to be adjusted for the actual hosts in your deployment. For example, if there are additional ES notes they will need to be added manually.

```
sudo sh -c "cd /usr/share/ro-ansible/sysconfdir/; sed -e
's/xxxxx/change_me/g' etc_ansible_hosts.example > /etc/ansible/hosts"

Example excerpt: /etc/ansible/hosts

##########################################

[api]

api-xxxxx

[ca]

ro-root-ca ansible_host=jenkins-xxxxx

[content]

cont-xxxxx

[conversion]

conv1-xxxxx

conv2-xxxxx

[curator]

curator-xxxxx ansible_host=jenkins-xxxxx

[es]

es1-xxxxx

es2-xxxxx

es3-xxxxx

##########################################
```

3. Create and configure `/etc/hosts`.

    Setup `/etc/hosts`, static table lookup for hostnames. The following command will place the example file in `/etc/hosts` with the updated hostnames. The IP addressess will need to be filled out.

✅ **Note**

This example file is based on a minimal deployment and will need to be adjusted for the actual hosts in your deployment. For example, if there are additional ES nodes they will need to be added manually.

```
sudo sh -c "cd /usr/share/ro-ansible/sysconfdir/; sed -e 's/xxxxx/change_
me/g' etc_hosts.example > /etc/hosts"

Example exert: /etc/hosts

###########################################

127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4

::1 localhost localhost.localdomain localhost6 localhost6.localdomain6

10.55.10.110 api-xxxxx

10.55.10.106 conversion-xxxxx

10.55.10.105 jenkins-xxxxx

10.55.10.120 kafka-xxxxx

10.55.10.122 es1-xxxxx

10.55.10.124 es2-xxxxx

10.55.10.136 es3-xxxxx

10.55.10.137 mds-xxxxx

10.55.10.138 mdslytics-xxxxx

############################################
```

4. Create and configure `/etc/ansible/group_vars/all`.

   There are two example files provided for the `/etc/group_vars/all` file, one for an **AWS install** and another for an **On-Prem install**. Choose the version based on your install location.

   > **Important**
   >
   > This file is extremely important and many errors in the install process are commonly due to missing variables or typos in this file. **All of the 'x' in this file will need to be manually modified as they are specific to the environment being created**.

```
# AWS Install Version

sudo cp /usr/share/ro-ansible/sysconfdir/group_vars/all.aws.example
/etc/ansible/group_vars/all


# On-Prem Install Version

sudo cp /usr/share/ro-ansible/sysconfdir/group_vars/all.on-prem.example
/etc/ansible/group_vars/all


Example exert: /etc/ansible/group_vars/all

###########################################

##offline install

yum_repo_epel_enabled: "{{ epel_repo_enable }}"
```

```
yum_repo_sslverify: "0"
ueba_offline_install: true


##environment name (domain)
ro_env: xxxxx
domain: "{{ domain_name }}"
tld: internal
domain_name: "ro.{{ tld }}"
###########################################
```

GENERATE AND PUSH SSH KEYS TO ALL HOSTS

1. Generate an SSH key pair.

   It is recommended to use passwordless ssh key authentication. To create the keys run the example below as the privileged (sudo) user:

   ```
   ssh-keygen -t ed25519
   ```

2. Copy SSH public key to all hosts defined in `/etc/hosts`.

   A script has been provided under `/usr/share/ro-ansible/sysconfdir/scripts/SSH_key_copy.sh` to allow the key generated above to be copied to all hosts in '/etc/hosts'.

   ✅ **Note**

   The script assumes there is a common password used for all of the hosts.

   To run the script

   a. Ensure permissions are set so that the script is executable.

   ```
   sudo chmod +x /usr/share/ro-ansible/sysconfdir/scripts/SSH_key_copy.sh
   ```

   b. Ensure **sshpass** is installed on the system which `sshpass` will be run.

      a. If **sshpass** is not installed, run the following command to install it:

      ```
      sudo yum install sshpass
      ```

   c. Run the following script and enter the password when prompted:

   ```
   bash /usr/share/ro-ansible/sysconfdir/scripts/SSH_key_copy.sh
   ```

> ✅ **Note**
>
> If your password contains an exclamation point (!), the shell script will attempt to interpret the the code prematurely and error out. If this occurs, you may need to manually change the script to use single quotes and the string of the password instead.

INITIALIZE FORCEPOINT CONTINUOUS DELIVERY SERVER

Based on the client-dictated ssh authentication method, adjust the following commands as necessary (remembering to include the private key or credentials, according to the previous section).

> ✅ **Note**
>
> Example (do not run this at this time) ansible command with ssh key:

```
ansible-playbook ro-baseline.yml -u centos --private-key=~/.ssh/client.pem
```

> ✅ **Note**
>
> Example (do not run this at this time) ansible command with ssh username and password:

```
ansible-playbook ro-baseline.yml -u centos -k
```

1. Deploy Jenkins host using the following command:

   > ➡️ **Tip**
   >
   > Before running playbook, all hosts must have SSH enabled and reachable from the provisioning ansible host via `/etc/hosts` or DNS.

   ```
   ansible-playbook /usr/share/ro-ansible/jenkins-init.yml
   ```

2. If deploying on-prem then deploy NFS server and client for shared storage.

   a. Update `/etc/hosts` to include the NFS server.

   Example:

   ```
   10.55.10.105 nfs-xxxxx
   ```

   b. Update `/etc/ansible/hosts` to include the NFS server. Note that the NFS server can be implemented on any of the hosts in the stack, but it is recommended to either be on the Postgres or Jenkins hosts.

   Example:

   ```
   [nfs]

   nfs-xxxxx ansible_host=postgres-xxxx
   ```

   c. Deploy the NFS server and client by running the following commands:

```
ansible-playbook /usr/share/ro-ansible/nfs-server.yml

ansible-playbook /usr/share/ro-ansible/nfs-client.yml
```

DEPLOY FORCEPOINT BEHAVIORAL ANALYTICS FROM JENKINS

1. Navigate to the Jenkins web-based service in a browser.

    a. The hostname can be reached by hostname, FQDN, or IP.

    Example:

```
- http://jenkins-customer.domain.com:8080

- http://jenkins-customer:8080

- http://10.0.0.100:8080
```

2. Log in to Forcepoint Continuious Delivery Server - Jenkens (Figure 3

    a. Default credentials are:

    Username: forcepoint

    Password: forcepoint

Figure 3: Jenkins Login

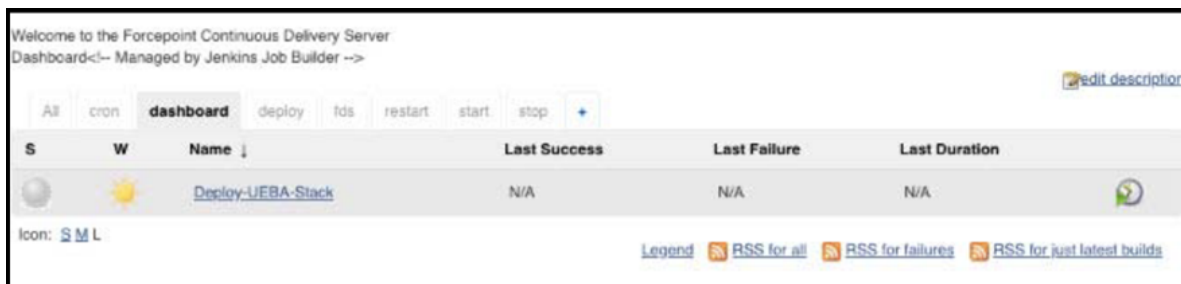3. Deploy the Forcepoint Behavioral Analytics Stack from Forcepoint Continous Delivery Server (Figure 4).

Figure 4: Jenkins Server

4. Check the deployment status from Forcepoint Continuous Delivery Server(optional).

a. The status and currently running deployment jobs can be found in the Build Executor Status window (Figure 5).

Figure 5: Jenkins Build Executor Status window

CREATE DEFAULT UI ADMIN USER

1. Create the first admin user for the UI.

    a. **Username**: redowl@redowl.com

    b. **Password**: redowl

    > ⓘ **Important**
    >
    > **Do not copy and paste the text below directly.** The line-wrapping does not allow the commands to be executed correctly. Copy instead from Jenkins host under `/usr/share/ro-ansible/sysconfdir/scripts/psql_admin_setup.sh`

Forcepoint Behavioral Analytics does not ship with an initial user configured. The default user will be created when the following commands are **executed on the postgress host** from the command line.

```
psql -U redowlpostgres -d the_ui -c "INSERT INTO USERS (email, encrypted_password,
name, created_at, updated_at, password_updated_at) VALUES
('redowl@redowl.com','\$2a\$06\$mMhM9IWYk1J3Q15tGgP5rOryw7Mo1m3JL0eydVOtJ20gmm4twDKMW'
,'Red Owl', CURRENT_DATE, CURRENT_DATE, CURRENT_DATE);"

psql -U redowlpostgres -d the_ui -c "INSERT INTO roles_users (role_id, user_id)
(SELECT r.id, u.id FROM roles r INNER JOIN users u ON (u.email LIKE
'redowl@redowl.com') WHERE r.id != 13);"

psql -U redowlpostgres -d the_ui -c "INSERT INTO groups_users (group_id, user_id)
values (1,1);"
```

Appendix

NOTES ON OPENVPN

⚡ **Warning**

This process is currently operations intensive due to the evolving customer deployment models.**These operations should only be performed by Professional Services.**

Things to consider

- The VPN host must be provisioned beforehand.
- The VPN host must have SSH enabled and reachable from the provisioning ansible host.
- The install and configuration are Ansible based.
  - `/etc/ansible/hosts` file must be accurate.
  - `/etc/ansible/group_vars/all` must be accurate and tailored to any site-specific overrides necessary.
  - Host machine running ansible playbooks must have ssh access to all hosts in the `/etc/ansible/hosts` inventory file.

Deploying OpenVPN

1. Baseline Forcepoint Behavioral Analytics VPN host.

```
ansible-playbook ro-baseline.yml --limit openvpn
```

2. Ensure SSH Key is Copied to Forcepoint Behavioral Analytics VPN host.

```
cp user.pem ~/.ssh/user.pem
chmod 600 ~/.ssh/user.pem
```

3. Retrieve Forcepoint Behavioral Analytics VPN host Public IP.

```
curl ipecho.net/plain
```

4. Install common Forcepoint Behavioral Analytics packages.
   a. **Always run** (do NOT confuse this with ro-common.yml):

```
ansible-playbook common.yml
```

   b. Optionally run:

```
ansible-playbook selinux.yml --limit openvpn
ansible-playbook ntp.yml --limit openvpn
ansible-playbook hostname.yml --limit openvpn
```

```
ansible-playbook ro-ssh.yml --limit openvpn

ansible-playbook hosts_file.yml --limit openvpn
```

5. Deploy OpenVPN Service.

```
ansible-playbook openvpn.yml
```

6. Start OpenVPN Service.

```
sudo systemctl restart openvpn@server.service
```

7. Create OpenVPN Users.

   a. Substitute `{{user}}` with correct username.

   b. Run from Forcepoint Behavioral Analytics VPN host:

```
sudo /etc/openvpn/addvpnuser.sh fp-ueba-ops-{{user}}

sudo su - {{user}}

passwd - enter password twice when prompted

cp /etc/openvpn/keys/{{user}}-vpn-*.tar.gz /home/{{user}}
```

   c. Copy `/home/{{user}}-vpn-*.tar.gz` to remote machine for Professional Services Engineer use.

8. Configure 2FA - Google Authenticator.

   a. Substitute `{{user}}` with correct username.

   b. Run from Forcepoint Behavioral Analytics VPN host logged in as the newly created user:

      i. google-authenticator.

         i. Correct question answers are: YYYNY

         ii. Copy the barcode and/or the url to add to the authenticator app.

9. Test Forcepoint Behavioral Analytics VPN connection.

   a. Substitute `{{user}}` with correct username.

   b. Run from Professional Services OSX host:

```
tar {{user}}-vpn-*.tar.gz -C {{user}}-vpn.tblk
```

   c. Drag and drop `{{user}}-vpn.tlbk` into tunnelblick configuration windows.

   d. Connect using username,password+googleauth.

Troubleshooting OpenVPN

- If authentication fails, ensure the password is set correctly. Reset password as necessary.

- Google-authenticator may need to be rerun.

- If name lookups are failing there is a bug in the tunnelblik software to where the client does not push the AWS DNS server and search domains to the local machine.

○ In this case, go to your primary network interface and manually add the route53 address x.x.x.2 for the DNS server and appropriate search domain.

DEPLOYMENT - AWS ENCRYPTION OPTIONS FOR NATIVE AND ATTACHMENT STORAGE

Forcepoint Behavioral Analytics supports various means of encryption options in AWS S3 for Native and Attachment storage in the Conversion Service. The default used is SSE-S3. Alternatively, SSE-C or SS3-KMS can be enabled. No UI configuration changes are necessary to enable either SSE-C or SSE-KMS, but the AWS IAM credentials used by the UI must be on the KMS key policy.

To enable one of the alternative AWS encryption options, alterations must be made to:

```
/usr/share/ro-ansible/roles/ro-conv/defaults/main.yml
```

Default Values:

```
# encryption for S3 storage; supported types are (sse-s3, sse-c, ss3-kms)
natives_encryption_type: sse-s3
attachments_encryption_type: sse-s3
# required if sse-c is enabled
natives_sse_c_key_file: ""
attachments_sse_c_key_file: ""
# required if sse-kms is enabled
natives_sse_kms_key_arn: ""
attachments_sse_kms_key_arn: ""
```

To enable sse-c:

```
# encryption for S3 storage; supported types are (sse-s3, sse-c, ss3-kms)
natives_encryption_type: sse-c
attachments_encryption_type: sse-c
# required if sse-c is enabled
natives_sse_c_key_file: "/path/to/my.key"
attachments_sse_c_key_file: "/path/to/my.key"
# required if sse-kms is enabled
natives_sse_kms_key_arn: ""
attachments_sse_kms_key_arn: ""
```

To enable ss3-kms:

```
# encryption for S3 storage; supported types are (sse-s3, sse-c, ss3-kms)
natives_encryption_type: ss3-kms
attachments_encryption_type: ss3-kms
# required if sse-c is enabled
natives_sse_c_key_file: ""
attachments_sse_c_key_file: ""
# required if sse-kms is enabled
natives_sse_kms_key_arn:
"arn:aws:kms:<region>:<account>:key/<key>"
attachments_sse_kms_key_arn:
"arn:aws:kms:<region>:<account>:key/<key>"
```

DEPLOYMENT - MANUALLY RUN ANSIBLE PLAYBOOKS

Prepare Forcepoint Behavioral Analytics Stack

1. Forcepoint Behavioral Analytics hostnames.

   ```
   ansible-playbook hostname.yml
   ansible-playbook hosts_file.yml
   ```

2. Forcepoint Behavioral Analytics baseline.

   ```
   ansible-playbook ro-baseline.yml
   ```

3. Install common Forcepoint Behavioral Analytics packages.

   a. Option 1 - Run everything:

   ```
   ansible-playbook ro-common.yml
   ```

   b. Option 2 - Run select playbooks, based on customer needs:

   i. **Always run** (do NOT confuse this with ro-common.yml):

   ```
   ansible-playbook common.yml
   ```

   ii. Optionally run:

```
ansible-playbook selinux.yml

ansible-playbook ntp.yml

ansible-playbook ansible-openssh.yml
```

4. Deploy **Forcepoint Behavioral Analytics Secrets**:

```
ansible-playbook vault.yml
```

5. To deploy **Forcepoint Behavioral Analytics Middleware**, deploy **Jenkins host**:

```
ansible-playbook jenkins.yml
```

6. Deploy **Redis**:

```
ansible-playbook redis.yml
```

7. Deploy **Postgresql**:

```
ansible-playbook postgres.yml
```

8. Deploy **RabbitMQ**:

```
ansible-playbook rabbit.yml
```

9. Deploy **Kafka**:

```
ansible-playbook kafka.yml
```

10. Deploy **ElasticSearch**:

```
ansible-playbook ro-es.yml
```

11. Deploy **Monitoring ElasticSearch**:

```
ansible-playbook ro-mon-es.yml
```

12. Initialize **Forcepoint Behavioral Analytics Schema**:

```
ansible-playbook ro-schema.yml
```

13. Deploy **Forcepoint Behavioral Analytics Monitoring Software**:

```
ansible-playbook ro-monitoring.yml
```

14. Deploy **Forcepoint Behavioral Analytics Master Data Service**:

```
ansible-playbook ro-mds.yml
```

15. Deploy **Forcepoint Behavioral Analytics Master Data Service** analytics node:

```
ansible-playbook ro-mdslytics.yml
```

16. Deploy **Forcepoint Behavioral Analytics API Service**:

```
ansible-playbook ro-api.yml
```

17. Deploy **Forcepoint Behavioral Analytics Queue Worker Service**:

```
ansible-playbook ro-qw.yml
```

18. Deploy **Forcepoint Behavioral Analytics Conversion Service**:

```
ansible-playbook ro-conv.yml
```

19. Deploy **Forcepoint Behavioral Analytics Content Service**:

```
ansible-playbook ro-cont.yml
```

20. Deploy **Forcepoint Behavioral Analytics UPS Service**:

```
ansible-playbook ro-ups.yml
```

21. Deploy **Rose Service**:

```
ansible-playbook ro-rose.yml
```

22. Deploy **Apache Nifi Service**:

```
ansible-playbook ro-nifi.yml
```

23. Deploy **Forcepoint UI Service**:

```
ansible-playbook ro-ui.yml
```

24. Deploy **Logstash**:

```
ansible-playbook ro-logstash.yml
```

25. Deploy **Kibana**:

```
ansible-playbook ro-kibana.yml
```

26. Deploy **Forcepoint Integration Service** (optional):

```
ansible-playbook ro-api.yml
```

27. Deploy **Security Features** (optional):

```
ansible-playbook ro-jobs.yml -i /etc/ansible/hosts -t
tls-version -f 5 -e set_tls_version=true -v
```

Deploying Curator

The `deploy-ueba-curator` job was removed from the deploy stack process as it requires Jenkins to restart at the end of the job. This causes the deploy process to appear as though it failed. Manually run the `deploy-ueba-curator` job after the install process is complete.