Forcepoint

Remote Browser Isolation

22.01

On-Premises Deployment Guide

Revision A

Published 28 January 2022

Contents

Chapter 1

Introduction

Contents

Forcepoint Remote Browser Isolation (Forcepoint RBI) helps organizations experience a safer internet by proactively stopping web, email, and document-based threats. This document captures the prerequisites for an on-premises deployment of Forcepoint RBI. Details have been provided for recommended network port openings required for communication.

Forcepoint RBI has three major components:

- Control Center Cluster (Master & Worker): The Control Center cluster contains the Forcepoint RBIAdmin Portal and Superadmin Portal. The Portal is responsible for policy management, user authentication, logging, dashboard, and reporting.
- RBC Cluster (Master & Worker): The Remote Browsing Containers (RBCs) house the remote browsers that connect to the Internet to fetch, execute, and render the content.
- Proxy: The proxy handles all traffic redirection from the end user's browser to the RBC.

This document provides the specifications required for the Virtual Machine and Network Communication. Refer to the *Sizing Guide* for hardware specifications for Forcepoint RBI.

Deployment prerequisites

Before deploying Forcepoint RBI in an on-premises environment, review these prerequisites.

- Virtualization platform should be based on any of the following virtualization products:
  - Virt-Manager (KVM)
  - Oracle VirtualBox
  - VMware
- Forcepoint RBI systems should be reachable from endpoint machines (end user systems).
- One IP address is to be assigned to each Forcepoint RBI component (master, worker, proxy).
- Public Wildcard SSL certificate or a Self-Signed SAN-based wild card certificate, including RBI servers IP address as SAN, is required for Forcepoint RBI. Public certificate, Private key, and CA certificates are required.
  For Self-Signed certificates, install the Root CA Chain Certificate on the endpoint machines under **Trusted Root CA Authority**.
- The FQDN names of Forcepoint RBI should be resolved by the endpoint machines by following one of these options:
  - Add DNS entries for Forcepoint RBI FQDNs and URLs to the respective domain.
  - Add the FQDN entries for Forcepoint RBI in the user's endpoint machine host file (`C:\windows\system32\drivers\etc\hosts`). This requires Admin access to the endpoint machine.

  - If there is a local/Internal DNS in place for resolving Intranet/Internal servers and it is configured as a DNS server in the user's endpoint machine, then create a zone for the domain of the FQDN in the Local/Internal DNS and add the host entries to it so that users can resolve the FQDNs through local/Internal DNS.
- The Forcepoint RBI instances need to be provided with DNS servers that can resolve Global domains.
- If a proxy server is in place, then the IP address and the port of the proxy server must be configured in Forcepoint RBI.
- Internet connectivity is required for setting up Forcepoint RBI and for browsing through Forcepoint RBI.
- For final deployment, the actual resource requirements are calculated based on the *Sizing Guide* and on the following:
  - User concurrency
  - Internet usage pattern
- The hardware specification requirement for production deployment will be in accordance with the *Sizing Guide*. The resource requirements are calculated based on the following:
  - User concurrency
  - Internet usage pattern
- The wildcard entry of the Forcepoint RBI base domain is to be bypassed (set exception) in the end user proxy settings.
- The Master and Worker for the respective cluster (Control Center and RBC) should be hosted in the same LAN segment.

Network communication requirements

Forcepoint RBI communicates with the endpoint using WebSocket on custom ports. This section shows the ports that needs to be opened for communication with Forcepoint RBI.

Connection	Required ports
Endpoint machine to Forcepoint RBI Control Center Cluster	tcp 443 (Session initialization)
Endpoint machine to Forcepoint RBI RBC Cluster	tcp 443 (Session initialization) tcp 30000 – 32767 (Secure WebSocket connection (WSS) for Remote Browsing container)
Forcepoint RBI Cluster Communication (Control Center Cluster to RBC Cluster)	tcp 443 (RBI cluster communication)
Internet access to Forcepoint RBI Cluster (RBC Cluster to Internet)	tcp 443 (Internet access to RBC Cluster) tcp "Proxy IP & Proxy Port" (Proxy IP and Proxy port in case Internet access is provisioned through Enterprise Proxy.)
Terminal access (Admin user to Forcepoint RBI instances)	tcp 2200
Forcepoint Web Security Gateway/Proxy settings	Add base domain wildcard (e.g., *.rbi.forcepoint.com) to bypass list in end user Proxy settings.
CDR Service: API call to CDR service from Forcepoint RBI	tcp 80, 443 (destination *.threat-removal.deep-secure.com)

Connection	Required ports
FTIS Service: API call to FTIS service from Forcepoint RBI	tcp 80, 443 (destination *. cloud.threatseeker.com)

Chapter 2

Deploying Forcepoint RBI

Contents

This chapter provides the instructions for deploying Forcepoint RBI in an on-premises environment, configuring Simple Mail Transfer Protocol (SMTP), and cipher implementation.

Deploy Forcepoint RBI

This topic provides the procedure for deploying Forcepoint RBI in on-premises environments. Before deploying Forcepoint RBI, obtain the ISO from Forcepoint.

Steps

1) Install and deploy the Forcepoint RBI ISO obtained from Forcepoint.

2) Each Forcepoint RBI instance/VM is to be setup using the same ISO.

3) After the VM is ready, SSH to the VM using port 2200, and assign the IP address to the VM.

Note

Keep a copy of the IP address, Netmask, Gateway, and DNS details. You will need these details later.

4) Set the IP addresses and network details:

   a) Open a command prompt or terminal and run the following two commands:

```
# cd scripts
# sudo ./setip.sh
```

   b) Select **interface 1** or the serial number against the interface name connected to the virtual network, then press **Enter**.

c) For **Do you want to use DHCP for this interface (y/n)**, type **n**, then press **Enter**. (Please set the static IP address)

d) Enter the **IP Address** (for example, **192.168.2.201**), then press **Enter**. (Please select your IP address)

e) Enter the **Subnet mask** (for example, **255.255.255.0**), then press **Enter**. (Please select your subnet mask)

f) Enter the **Gateway** (for example, **192.168.2.1**), then press **Enter**. (Please select your gateway)

g) Enter the **DNS IP** (for example, **8.8.8.8**), then press **Enter**. If you are entering multiple DNS IP addresses, separate the IP addresses with commas. (Please select your DNS)

h) Repeat these steps on all required VMs.

5) Verify the IP address with the following command:

```
ip a
```

```
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:0c:29:b9:ea:d8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.2.201/24 brd 192.168.2.255 scope global ens33
       valid_lft forever preferred_lft forever
    inet6 fd15:4ba5:5a2b:1002:20c:29ff:feb9:ead8/64 scope global tentative mngtmpaddr dynamic
       valid_lft 86400sec preferred_lft 14400sec
    inet6 fe80::20c:29ff:feb9:ead8/64 scope link
       valid_lft forever preferred_lft forever
```

6) Shut down the VM, then start the VM again.

```
sudo shutdown -h now
```

7) SSH to the VM using port 2200.

8) Using WinSCP or scp, copy the deb package provided by Forcepoint, then install:

```
sudo dpkg -i <debpackage>
```

9) Update `/opt/rbi/rbi-installer/cluster.yaml` with the following required details:

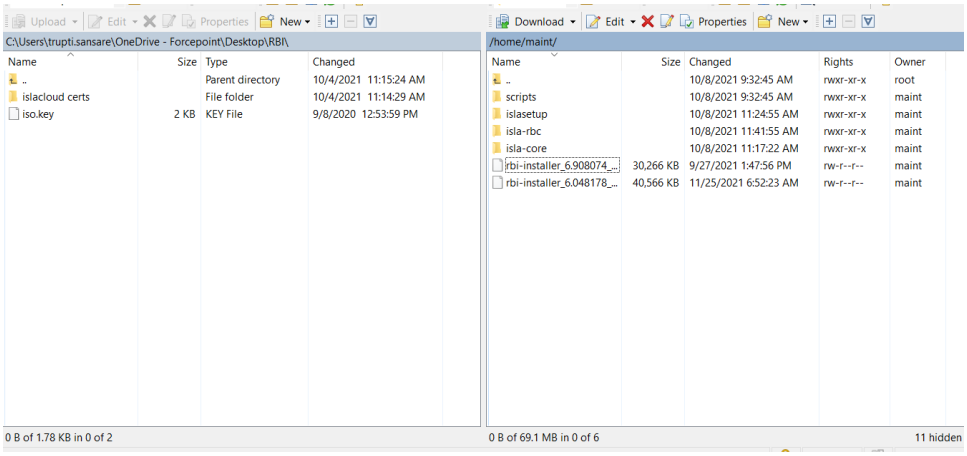
```
nano /opt/rbi/rbi-installer/cluster.yaml
```

a) Add the client certificates.

```
kubernetes:
  certs:
    publickey: keys/fp.dev.crt
    privatekey: keys/fp.dev-domain.key
    ca: keys/fp.dev-CA.crt
```

Note

Use WinSCP or the `scp` command to copy the required certificate and key to `/opt/rbi/rbi-installer/keys`.



b) Add the Core master node 1 IP address (VM IP address):

```
  loadbalancer:
    ip: ""
  baseurl: .fp.dev
  cluster:
    core:
      masters:
      - node: 1
        ip: 192.168.122.231
        sshport: 2200
        sshuser: maint
        reset: 0
```

c) Add the Core worker node 1 IP address (VM IP address):

```
  workers:
  - node: 1
    ip: 192.168.122.231
    sshport: 2200
    sshuser: maint
    reset: 0
```

If there are multiple workers, add entries for each worker (for example, from node to reset for each worker).

d) Add the RBC master node 1 IP address (VM IP address):

```
rbc:
  masters:
  - node: 1
    ip: 192.168.122.231
    sshport: 2200
    sshuser: maint
    reset: 0
```

e) Add the RBC worker node 1 IP address (VM IP address):

```
workers:
- node: 1
  ip: 192.168.122.231
  sshport: 2200
  sshuser: maint
  reset: 0
```

If there are multiple workers, add entries for each worker (for example, from node to reset for each worker).

f) Add cluster information. For example:

```
data:
                    core:
                        valuepath: values-on-prem.yaml ( File which needs to be used for
 helm core installation)
                        releasename: core (Name of the release for core)
                        reset: 0
                    rbc:
                        location: 1 ( Based on the region. USA = 1, UK = 2)
valuepath: values-on-prem.yaml ( File which needs to be used for helm rbc installation)
                        releasename: rbc (Name of the release for rbc)
                        reset: 0
```

```
helm:
  cluster:
    core:
      valuepath: values-on-prem.yaml
      releasename: core
      reset: 0
    rbc:
      location: 1
      valuepath: values-on-prem.yaml
      releasename: rbc
      reset: 0
```

Note

If the Core Master and RBC Master IP addresses are the same, then select **values-on-prem-single.yaml** instead of **values-on-prem.yaml** for both the **core** and **rbc** clusters.

g) Add database password (Default password is test123# encoded to base64).

```
database:
  dbuser: isla
  dbpass: dGVzdDEyMyMK
```

h) Add superadmin details under the data tag. For example:

```
data:
                    superadmin:
                        name: rbiadmin (This will become the superadmin url e.g. https://
rbiadmin.secureinc.org
                        email: admin@secureinc.org (Administrators email address)
                        password: Default password is “Welcome123#” encoded to base64.
```

```
data:
  superadmin:
    name: rbiadmin
    email: admin@secureinc.org
    password: V2VsY29tZTEyMyMK
```

i) Add tenant details under the data tag. For example:

```
tenants:
                     host: rbi (This will become the tenant url e.g. https://
rbi.secureinc.org
                        email: admin@rbiinc.org (Administrators email address)
                        password: Default password is “Welcome123#” encoded to base64.
```

```
tenants:
- host: rbi-tenant-ggg
  name: Rbi-tenant
  squidport:
  admin:
    name: Rbi-tenant
    email: admin@rbi-tenant.org
    password: V2VsY29tZTEyMyMK
```

j) Add the tenant hostname in appliance-rbi:

```
appliances:
- name: appliance-rbi
  tenanthost: rbi
  minnodes: 2
  maxnodes: 2
  racversion: ract-direct:r89-5.5.11
  racurl: https://rbc-cluster-down.fp.dev
```

k) Add the **rac-url** (RBI server url) in **appliances-racurl**. Also, based on the license, modify the **minnodes** and **maxnodes**. For example, if the license is for 1,000 sessions, then minnodes can be 100 and maxnodes can be 1000.

```
  minnodes: 2
  maxnodes: 2
  racversion: ract-direct:beta-92-6.0.3
  racurl: rbc-cluster-gg.fp.dev
```

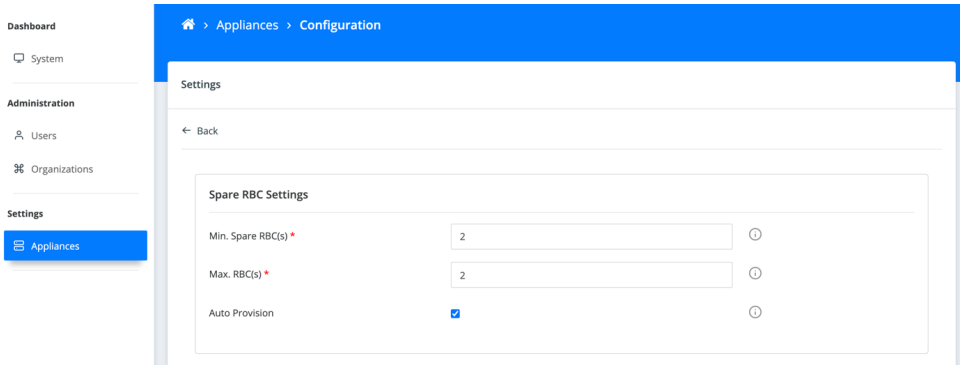
10) Run the **islasetup** from `/opt/rbi/rbi-installer`.

```
./islasetup cluster.yaml
```

11) Add the required host file entries if DNS is not added to the public domain. For example:

```
Core Master ip rbiadmin.secureinc.org rbi.secureinc.org
RBC Master ip rbi-cluster.secureinc.org
RBC Worker1 ip(say x.x.x.x) rbchost-x-x-x-x.secureinc.org
RBC Worker2 ip(say y.y.y.y) rbchost-y-y-y-y.secureinc.org
```

12) After the installation, sign in to the Forcepoint RBI superadmin portal and select **Auto Provision** under **Settings** > **Appliances**.



13) For anonymous browsing, the URL will be **https://<replace_With_tenant_url>/viewer/loader?tenantId=<replace_with_tenantid>&username=<replace_with_username>url=<replace_with_site_navigate>**. The Tenant ID can be found in the Forcepoint RBI Admin Portal.

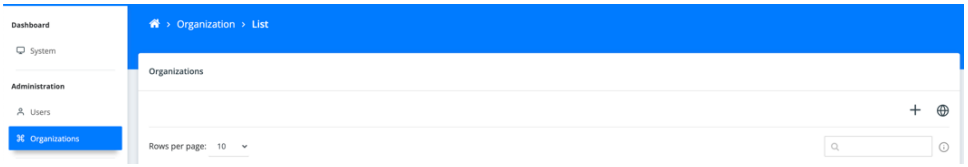
Configure SMTP

Simple Mail Transfer Protocol (SMTP) configuration enables email notifications to administrators through the Forcepoint RBI Portal.

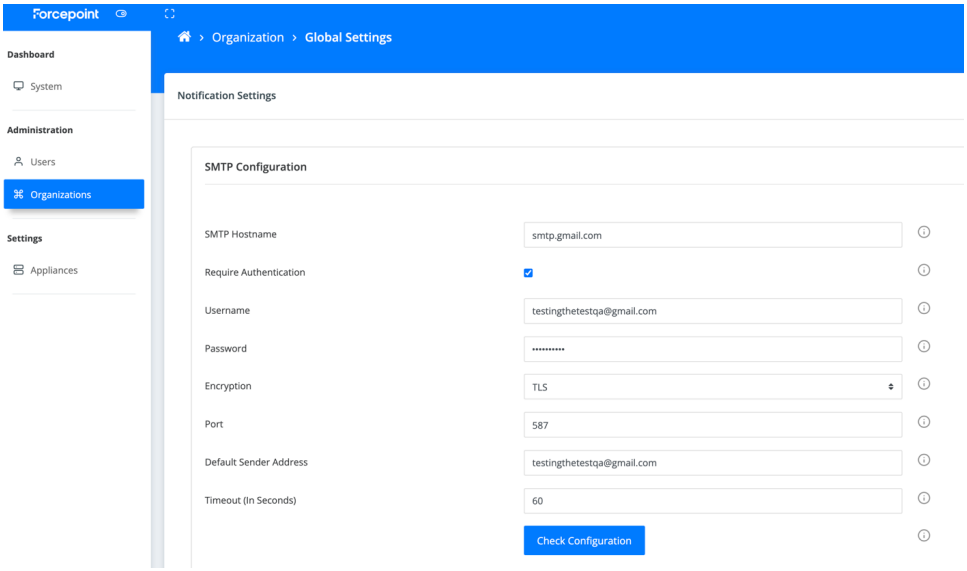
Steps

1) Sign in to the Forcepoint RBI superadmin portal and go to **Organizations**.

2) Click the globe icon to open Global Settings.



3) In **Global Settings**, enter the SMTP configuration shown in the following image:



4) Click **Check Configuration**. If the entered configuration settings are correct, then a **SMTP Configured Successfully** banner is shown at the top of the portal.

Note

If you are configuring a Gmail account to set up SMTP in the Control Center, then you need to enable **Less Secure App Access** under the account settings in Google.

Cipher implementation

This topic provides the procedure for implementing the Forcepoint-approved ciphers.

Steps

1) SSH to the Core Master and edit kubelet config.yaml:

```
sudo vim /var/lib/kubelet/config.yaml
```

2) Add the following content to the end of the file:

```
tlsCipherSuites: [TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305,
TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305,TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256,
TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384,
TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384]
```

3) Restart kubelet.service:

```
sudo systemctl restart kubelet.service
```

4) Edit kube-apiserver.yaml:

```
sudo vim /etc/kubernetes/manifests/kube-apiserver.yaml
```

5) Add the following content at the end of the **Command** section:

```
- --tls-cipher-suites=TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305,
TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305,TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256,
TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384,
TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
```

6) Check that the nodes are up:

```
kubectl get node
```

7) Repeat these cipher implementation steps for all Masters.

Custom DNS implementation (optional)

This topic provides the procedure for implementing custom DNS when the public certificates are pointing to specific IP address.

Steps

1) Open the file in the editor.

```
sudo vim /etc/dnsmasq.conf
```

2) Update the file with following lines.

```
listen-address= <ip address of master>
interface= <Name of the interface>
# Nameservers
server=<DNS server IP>
server=<if having multiple DNS servers, add lines accordingly>
```

3) Make sure Master has `/etc/hosts` entries for the domain.

4) Execute the below command to restart `dnsmasq` service.

```
sudo systemctl restart dnsmasq
```

5) Patch the core dns of the Kubernetes with IP address of master in config map.

```
kubectl patch configmaps/coredns -n kube-system -p '{"data":{"Corefile":".:53
{\n errors\n health {\n lameduck 5s\n }\n ready\n kubernetes cluster.local
in-addr.arpa ip6.arpa {\n pods insecure\n fallthrough in-addr.arpa ip6.arpa\n
ttl 30\n }\n prometheus :9153\n forward . <ip address of master> {\n
max_concurrent 1000\n }\n cache 30\n loop\n reload\n loadbalance\n}\n\n"}}'
```

6) To watch `kube-system pod`, execute the below command:

```
watch kubectl get po -n kube-system
```

7) Confirm the changes in config map of `coredns`, once the `coredns` pods are restarted.

```
kubectl describe cm -n kube-system coredns
```