blacksands

System Administration

Secure Connection as a Service

May 2018

Trademarks

You can report errors or omissions in this or any Blacksands technical document to techdoc@blacksandsinc.com.

v. 1.4

1. Introduction

Blacksands is a revolutionary connectivity solution, providing unparalleled security and flexibility for today's dynamic organizational requirements without the massive overhead of traditional ad-hoc systems. Blacksands' Secure Connection as a Service (SCaaS) provides unparalleled security and flexibility in an incredibly user friendly interface.

This introduction will describe the simple installation, deployment, and management of Blacksands' Secure Connection as a Service (SCaaS). Blacksands' solution offers an Invisible Edge, Unique User/Device Certificates, a Simple Management Interface, and Dynamic Point-to-Point Connections.

Blacksands is OS and device agnostic, meaning it can run on most operating systems and devices.

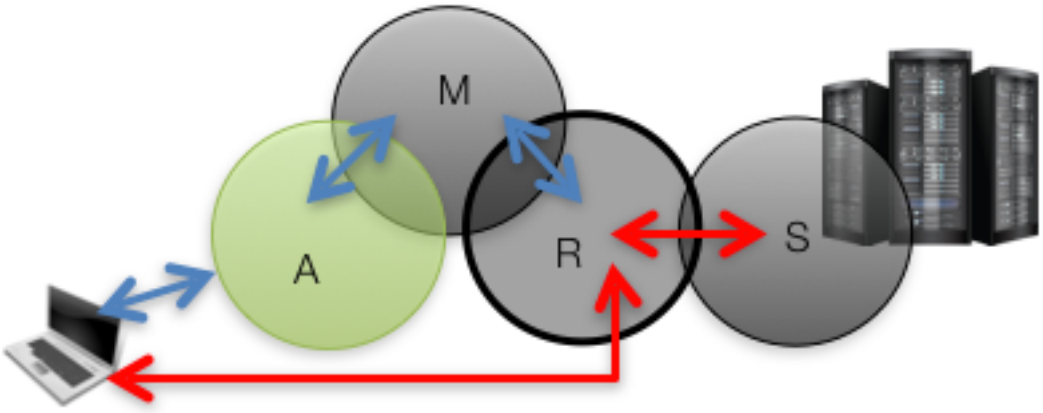
Blacksands is compatible with Google's Chrome browser, Microsoft Explorer and Firefox.

1.1.Basic Architecture

Blacksands proprietary 'Separation of Powers Architecture' provides unparalleled security, scalability, flexibility, and is simple to use.

1. **Authorizer** – forward facing identification system
2. **Manager** – invisible, external cloud management system
3. **Receiver** – invisible, software/hardware edge device and gateway
4. **Certificates** - unique industry standard certificates for every user device

Blacksands' proprietary, 'Separation of Powers' architecture is designed to invert the typical internet connectivity process. Instead of the standard Trust but Verify process where one connects to the entire internet and then attempts to filter out malicious or illegitimate traffic, Blacksands, prior to making any network connection at the edge, dynamically authenticates, authorizes, and provides point-to-point routing through its external management architecture to pre-defined services (PCs, Applications, IoT Devices).

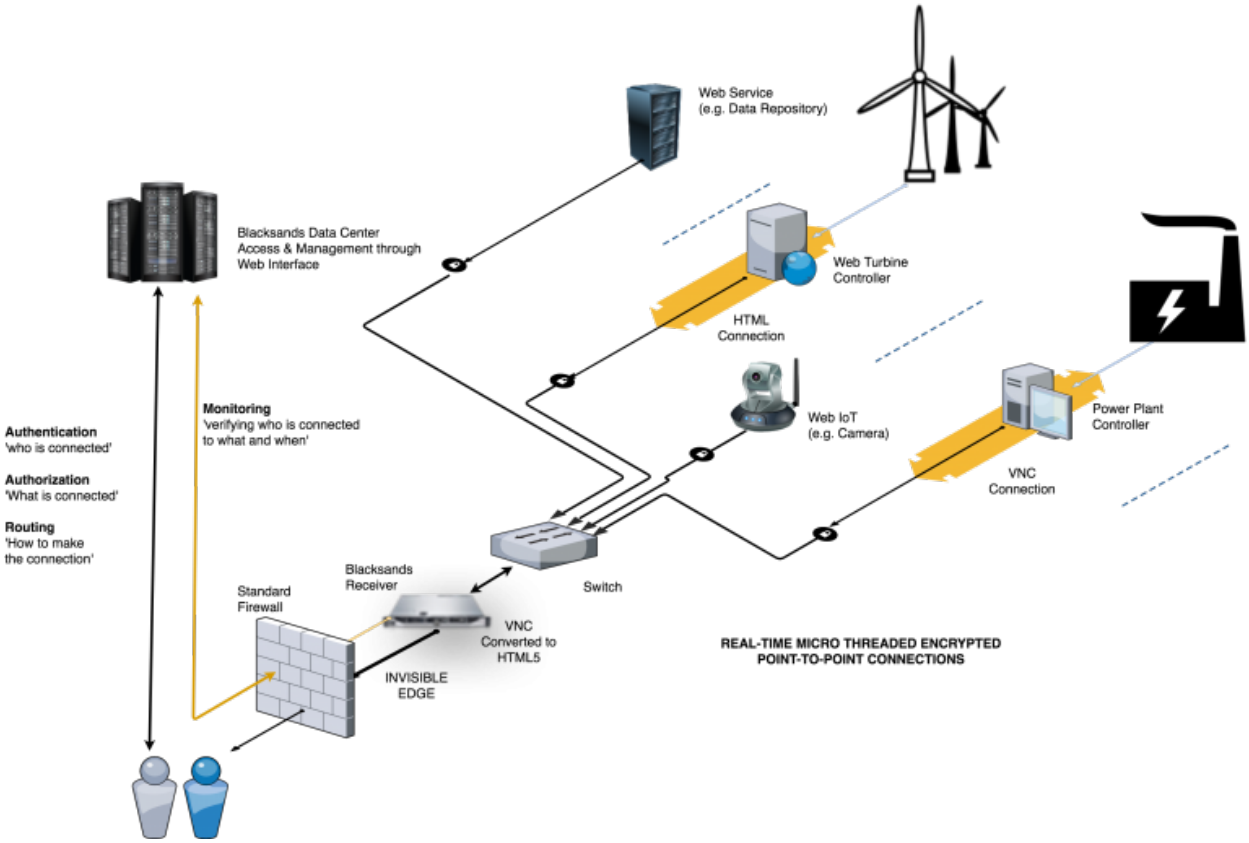


STEP 1 A secure connection begins when a user establishes an encrypted session to a Blacksands' Authorizer (A). The Authorizer's job is to identify the users, maintain a connection heart-beat, provide routing information for selected services from the Manager (M). The user is identified using two-factor authentication (unique certificate and password). Neither the password nor a hash of the password is ever passed over

the internet. Once a user is identified, the user is provided a list of authorized services.

STEP 2 When the user selects a particular service through the Authorizer (A), the Manager (M) sets up the point-to-point connection. The Blacksands Receiver (R) is dynamically set to receive a new session from a particular user, with a specific certificate, at a specific IP address and route the session to a particular service on the back end. Simultaneously, the user is provided the route to the particular Receiver, providing an encrypted, point-to-point connection.

STEP 3 The user's new point-to-point connection is made to the Receiver (R). The user again passes their unique certificate to the Receiver (R) front end. The Receiver proxies the new connection to a particular Service (S) at a specific IP address and port.



1.2. Introduction of Roles

Blacksands has three basic roles:

- **Administrators** – global visibility and control of the organization's Blacksand's system
- **Stakeholders** – local management of pre-determined services and user access to those services
- **Users** – simple, secure access to authorized services

Both Administrators and Stakeholders have access to the Blacksands' Manager. Administrators have global visibility and control over all Users, Receivers, and Services within their organizational unit. Stakeholders have local management over User access to particular Services where they have been granted Stakeholder rights.

Administrators can create new Users by providing a few pieces of information including the User's email address. Once created, the new User will receive an email with instructions to create his/her Blacksands Certificate. (above)

Administrators can create new Services by providing basic networking information and a Blacksands' provided FQDN. Each Service is provided its own, unique, obfuscated FQDN (automated Blacksands process) and requires a routable IP and Port.

Administrators can add and remove Stakeholders to specific Services on an individual basis. The Stakeholder will only be able to see and modify attributes of that particular Service, primarily User access.

Administrators and Stakeholders can add and remove Users to a Service. While Administrators can manage all Services, the Stakeholder can only see/manage his/her particular assigned Service/s.

1.3.Introduction to the Blacksands' Receiver

The Blacksands Receiver provides unparalleled security, control, and flexibility.

TOTAL CONTROL OF THE EDGE:

- Blacksands creates invisible private networks providing a drastically reduced threat vector for critical infrastructure
- Blacksands dynamic Authentication, Authorization, and Routing allow real-time session control and network architecture
- Blacksands dynamically creates and manages unique, point-to-point, encrypted connections without exposing anything else on the host network, controlling the traffic from OSI layers 3-7
- Blacksands can be combined with existing tools to form a cohesive and comprehensive tactical network defense plan

Blacksands focuses on networks, endpoints, applications, and data. It can be deployed to provide secure connection for web based applications and devices, as well as PCs (view only or full control). Typical endpoints include – robotics controllers, file repositories, web cameras, and productivity management systems.

TYPICAL DEPLOYMENT

- Receiver (Hardware / VM) deployed behind standard firewall
- Blacksands' SCaaS (Secure Connection as a Service) includes external Management, including dynamic authentication, authorization, and routing
- Integration into existing internally TCP/IP networked architecture using internal IP or internal DNS
- Human connection through user friendly web based interface
- Application connection control through simple API
- Optional Internal Authorizer for LAN SCaaS

2. User Access

2.1. User Certificate Management

Blacksands uses Certificates for a number of critical operations, first and foremost, for identification of the person or application initiating the connection. Blacksands uses high-end industry standard certificates which are managed in Blacksands' own certificate authority.

USAGE

The initial connection process with https//:client.blacksandsecurity.com utilizes a dual certificate based authentication process where both the site and the user must share and accept one another's Certificates.

The same User Certificate that is passed in the initial authentication process is used for every new Service connection. This means that each time a new service is opened the Receiver requests the User to pass, their Certificate again.

Blacksands issues unique Certificates for each User device that will be connecting to a given Service. That means that a specific User may have multiple devices (i.e. laptop, work desktop, tablet device…) each with a unique Blacksands' Certificate. This provides the company with the ability to efficiently and securely manage multiple User devices including BYOD.

The Blacksands' User Certificate lives within a Blacksands Certificate chain. Industry best practices require the three public certificates :

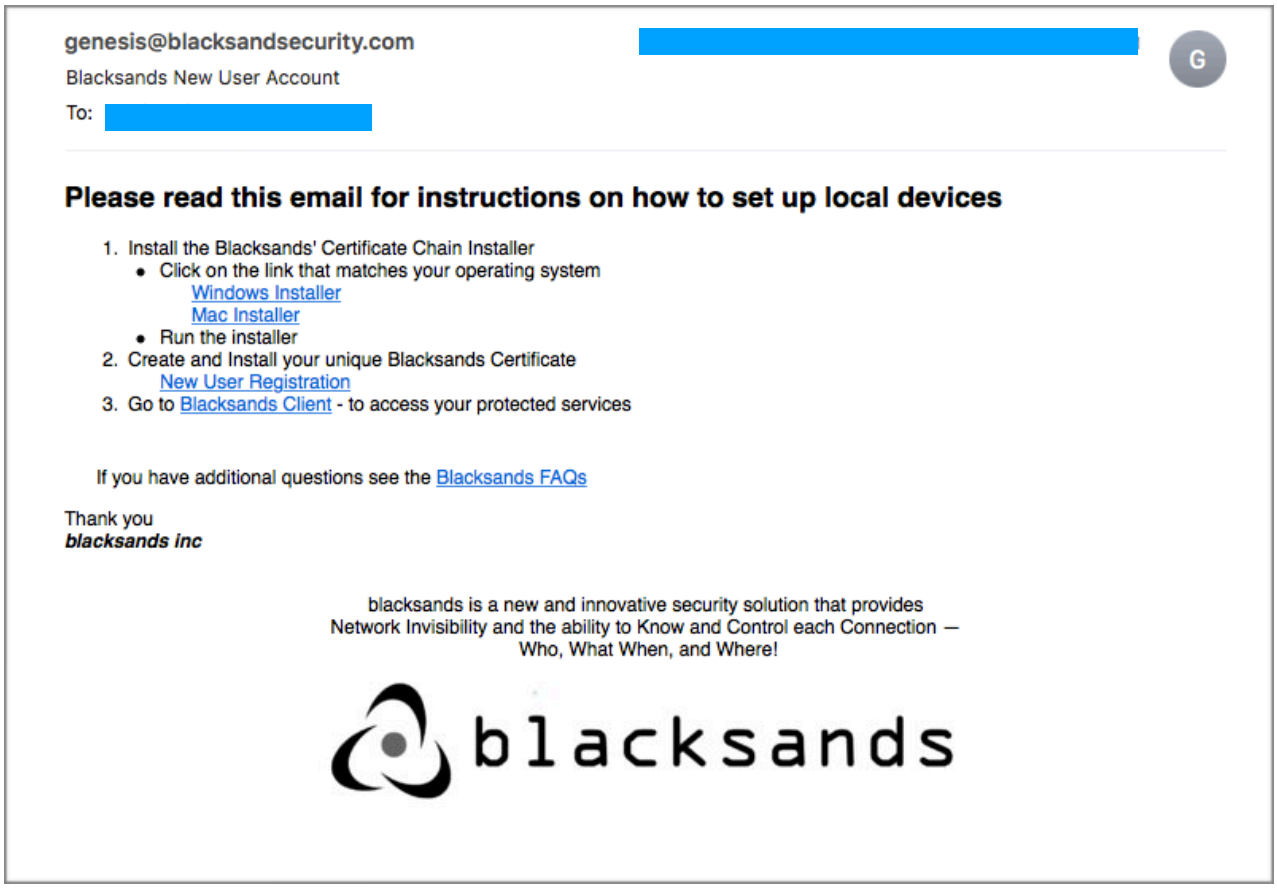
- blacksands_inc_ca_root.crt
- blacksands_inc_ca.crt
- blacksands_ca_l3.crt

Each of the above certificates must be installed prior to the User Certificate.

2.2. New User Registration

A new Blacksands' User will receive an email invitation. This email has basic instructions and links to the required Blacksands Certificate Creation and Installation functions.

IMPORTANT:
It is important to note that the 'New User Registration' link is a one time use only link and is available for 72 hours. Therefore, the email must be opened on the appropriate device that will be used to access the Blacksands' protected service/s.



genesis@blacksandsecurity.com [redacted]

Blacksands New User Account

To: [redacted]

Please read this email for instructions on how to set up local devices

1. Install the Blacksands' Certificate Chain Installer
   - Click on the link that matches your operating system
     - Windows Installer
     - Mac Installer
   - Run the installer
2. Create and Install your unique Blacksands Certificate
   - New User Registration
3. Go to Blacksands Client - to access your protected services

If you have additional questions see the Blacksands FAQs

Thank you
blacksands inc

blacksands is a new and innovative security solution that provides Network Invisibility and the ability to Know and Control each Connection — Who, What When, and Where!

blacksands

Blacksands New User Account Email

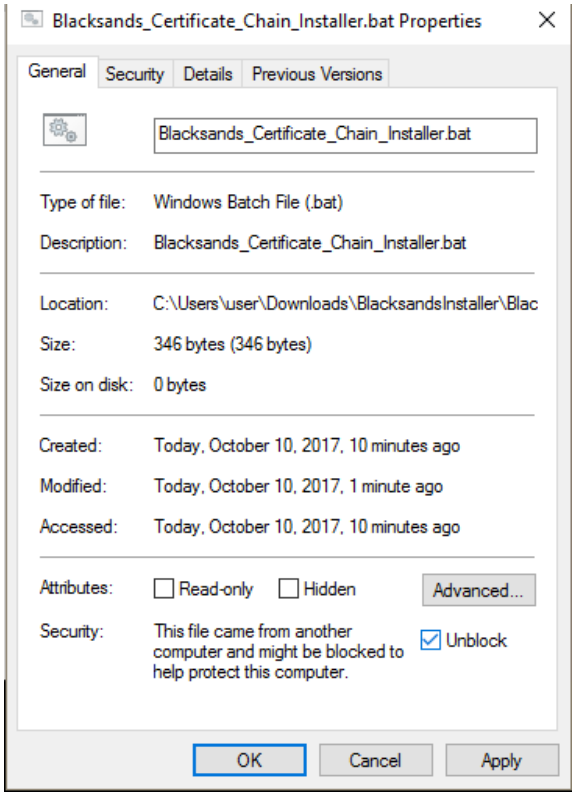
2.2.1.Windows Certificate Installation

I. The User downloads the appropriate Installer (Windows) and installs the Blacksands Certificate Chain. (Blacksands New User Account Email)

I.A. Often the User will need to 'Unlock' the Blacksands Certificate Chain Installer.exe file in order to run it. (This is because the Blacksands' Certificates are not yet installed on their device)

I.B. Right Click on the file

I.C. Click 'Unlock'

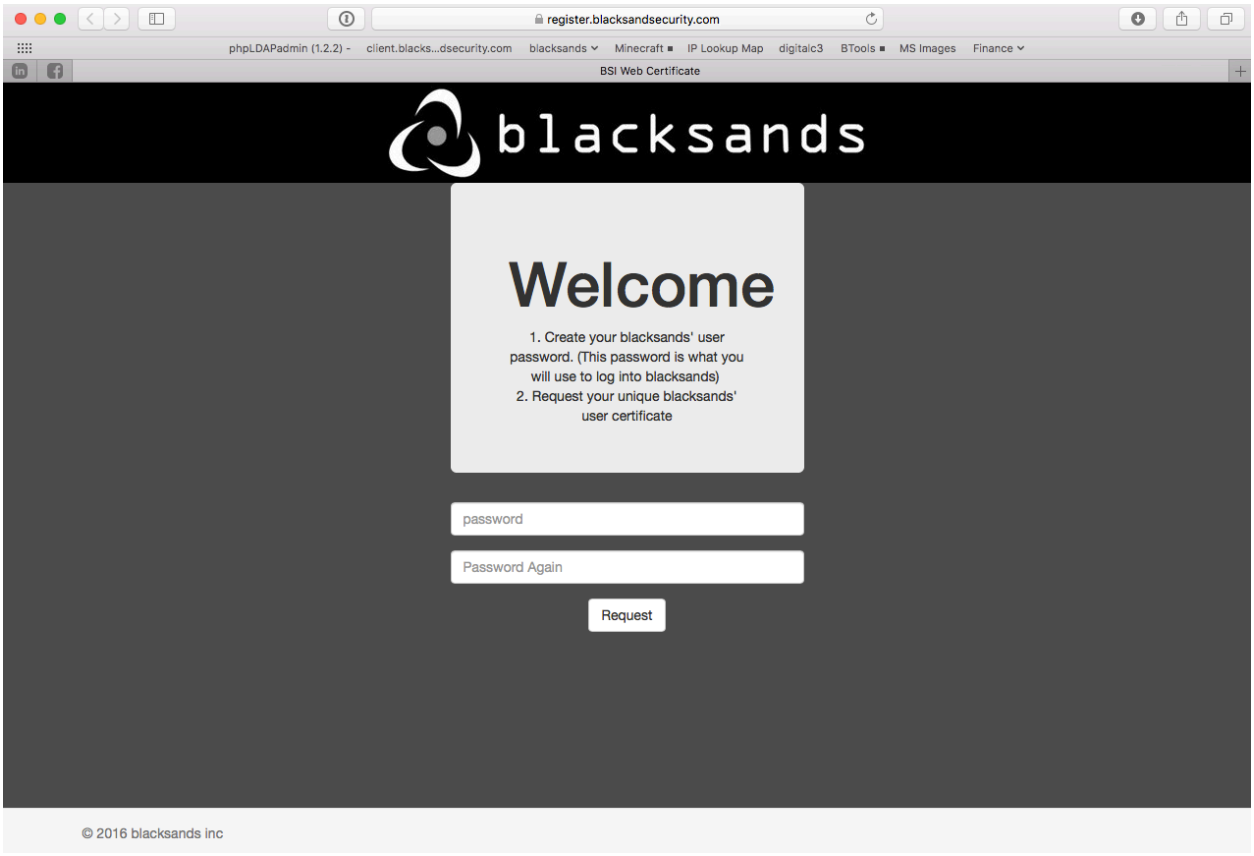


I.D. Click 'OK'

II. Run the Installer

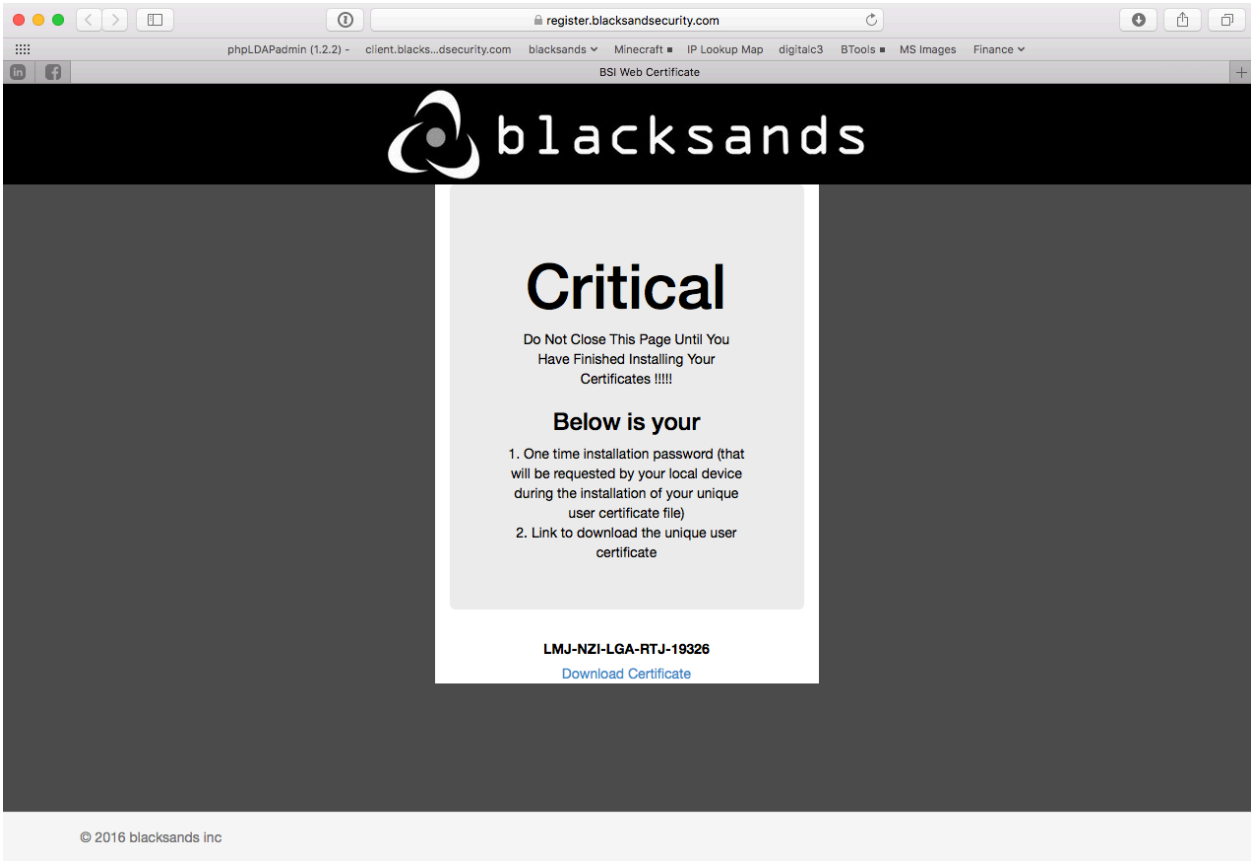
III. The User clicks on the "New User Registration" link (Blacksands New User Account Email) and generates their unique Certificate.

III.A.The default browser will go to https://register.blacksandsecurity.com



III.B.The User inputs their new Blacksands Password (twice)
III.C.Blacksands generates their unique User Certificate
III.D.The User downloads the Certificate

III.E.DO NOT CLOSE THE WINDOW – as it has the Installation Password



IV. The User double clicks the downloaded Certificate.

V. The OS will ask for the Password. This is the Installation Password in the above window. This is the only time the Installation Password is used.

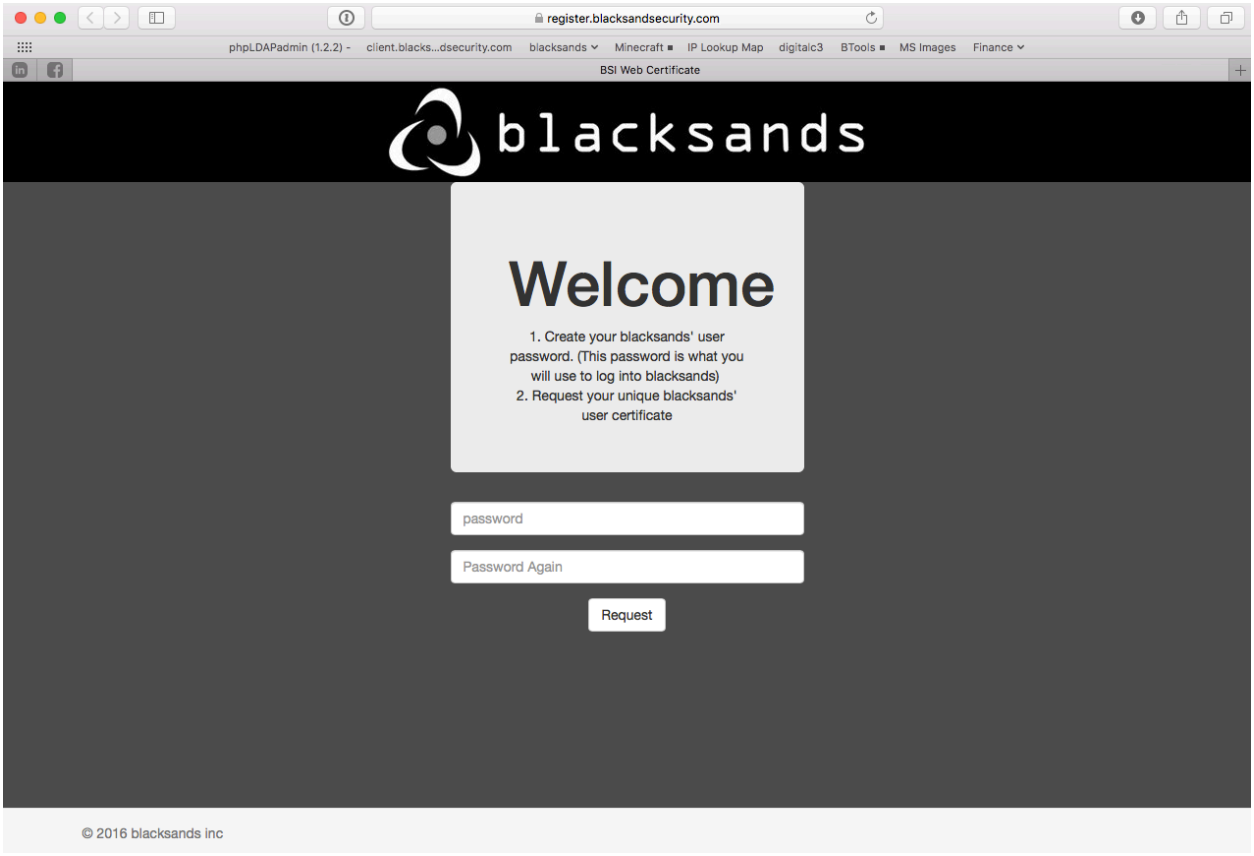
V.A.The User inputs the Installation Password and installs their unique Certificate on their device.

2.2.2.OSX Certificate Installation

Installing Blacksands' Certificate chain and unique Certificate:

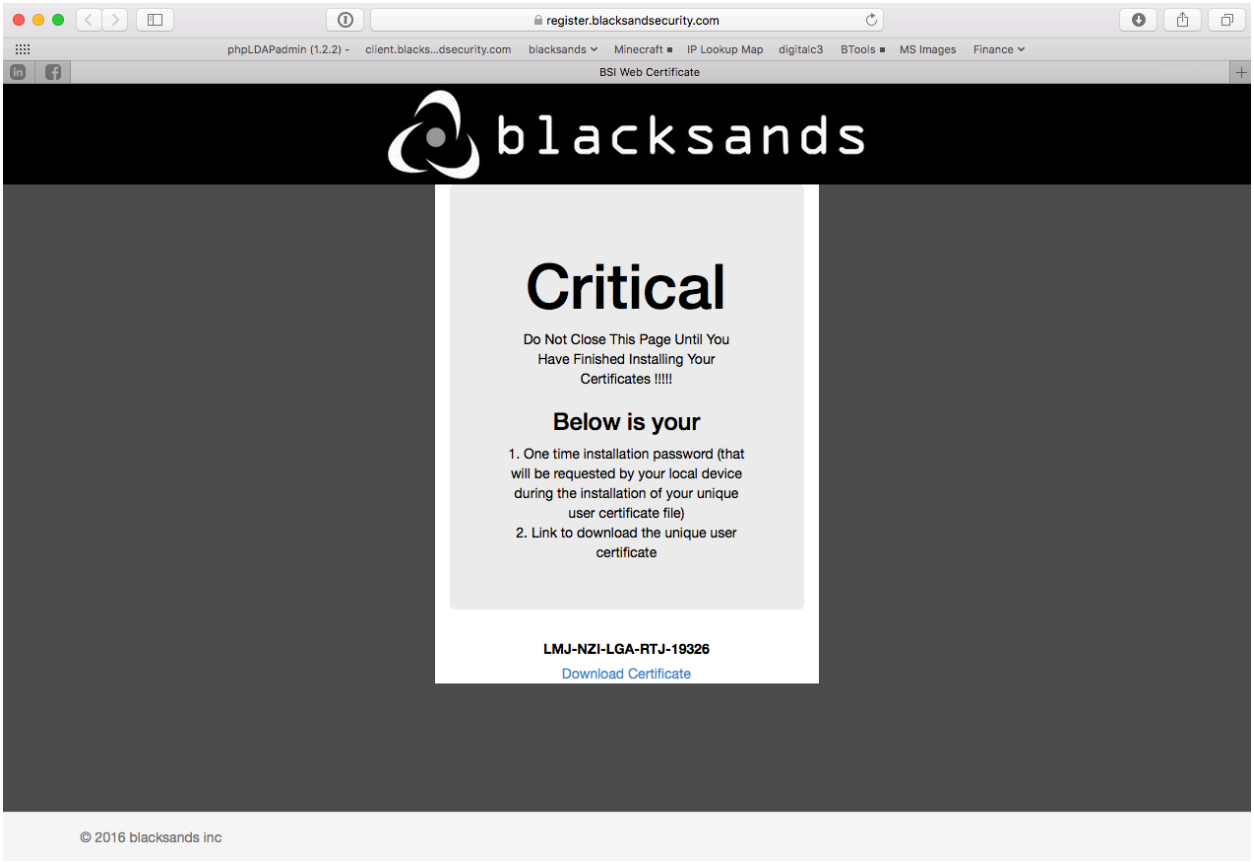
I. Download the Mac Installer from the email or https://github.com/blacksandsinc/osx/blob/master/Blacksands.dmg
II. Double click the Blacksands.dmg file. (you may have to allow this in the Mac security settings)

III. The User clicks on the "New User Registration" link (Blacksands New User Account Email) and generates their unique Certificate.
IV. The default browser will go to https://register.blacksandsecurity.com



IV.A.The User inputs their new Blacksands Password (twice)
IV.B.Blacksands generates their unique User Certificate
IV.C.The User downloads the Certificate

IV.D.DO NOT CLOSE THE WINDOW – as it has the Installation Password



V. The User double clicks the downloaded Certificate.

VI. The OS will ask for the Password. This is the Installation Password in the above window. This is the only time the Installation Password is used.

VI.A. The User inputs the Installation Password and installs their unique Certificate on their device.

2.3. Authentication, Authorization, and Routing

To access any Blacksands' protected Service a User must first be Authenticated, Authorized, and then Routed. This process is unique to Blacksands and attempting to access a Blacksands' protected Service in any other way is not possible.

The process is quite simple. A legitimate User with an installed Blacksands' Certificate on the device they are using, proceeds to a Blacksands' Authorizer (https://client.blacksandsecurity.com), provides his/her Certificate, Password, and then selects the protected Service desired. A new window will be opened in the User's browser, and a point-to-point encrypted connection is established from the User's device to the protected Service.

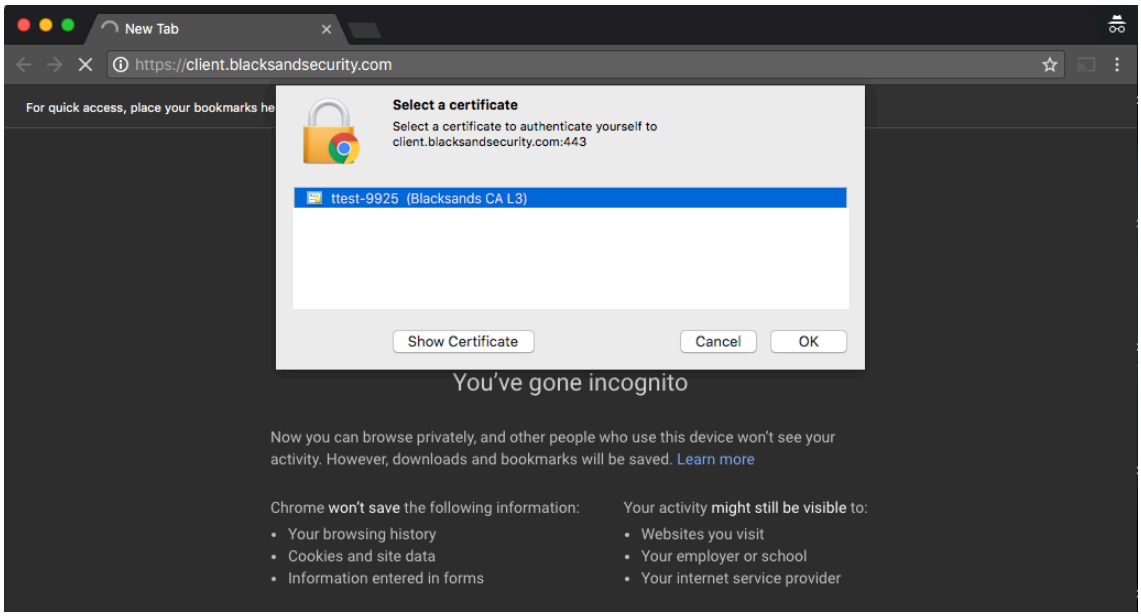
Three Requirements:

- The User must have a legitimate Blacksands Certificate already installed on the connecting device.
- The User must use a supported Blacksands OS and browser.
- The User device must have an internet connection that is able to access the Blacksands Authorizer and Receivers.

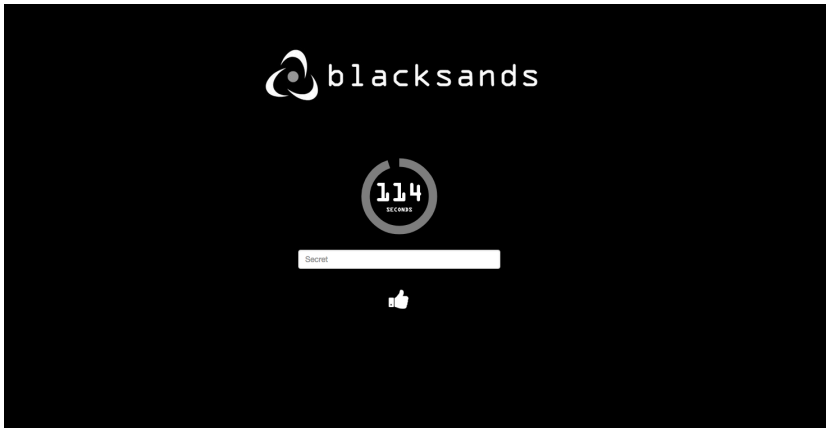
2.3.1.User / Device Authentication

Blacksands authenticates Users utilizing multi-factor authentication. The two-factors used are - something you have (Certificate) and something you know (Password).

The User proceeds to https://client.blacksandsecurity.com. Before any information is returned to the User's browser, Blacksands will request the unique User Certificate.

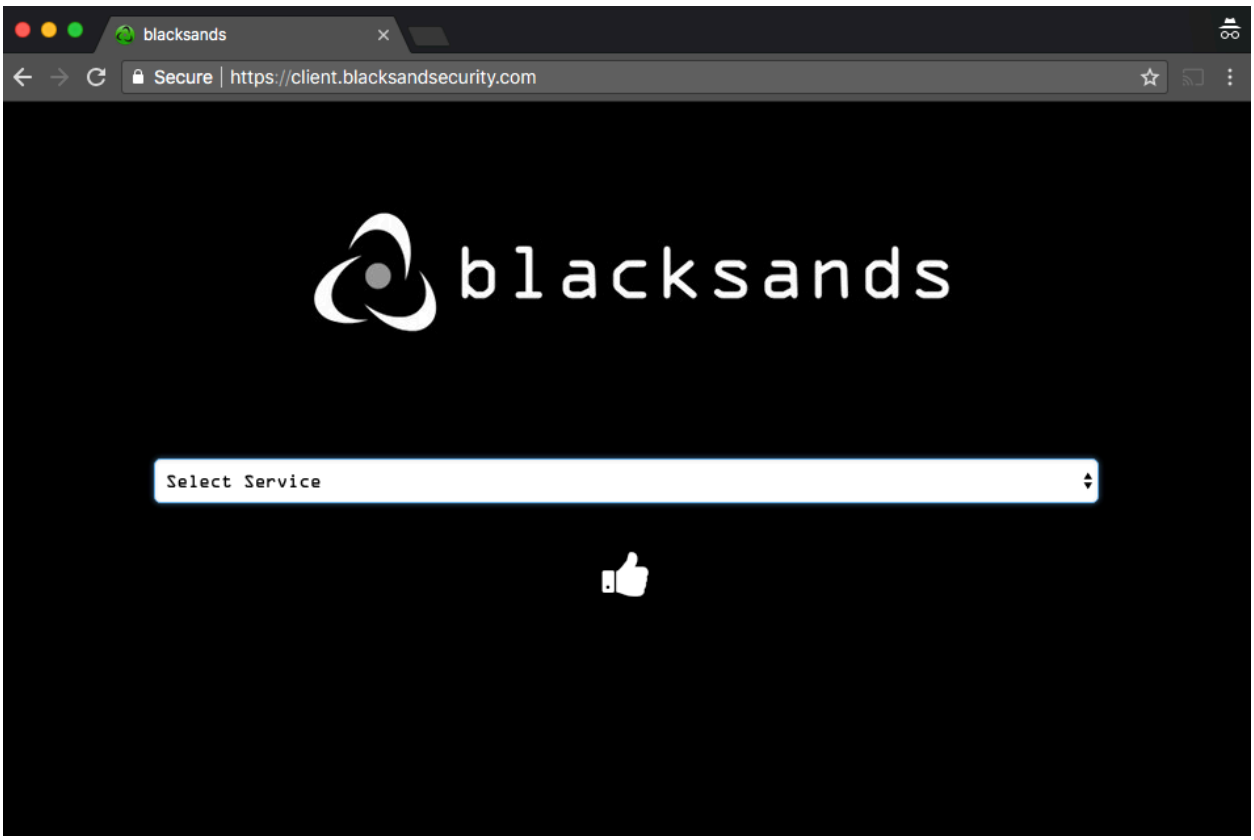


When the User provides a legitimate Blacksands' Certificate, Blacksands verifies the User's identity by requesting the User's Password.



The Blacksands' Authorizer provides 120 seconds for password verification. If the legitimate password is not provided in that window the session ends and the browser must be refreshed to begin again.

When a legitimate password is provided Blacksands populates the browser with the User's specific available Services in a drop-down menu. The User is able to highlight a Service and select the Thumbs Up to proceed to that service.



2.3.2. User / Device Authorization

Users are never provided an option for any Service that he/she has not been given permission to access. Therefore, only legitimate Services are listed in the drop-down list. When a pre-Authorized Service is selected and the Thumbs Up button activated, the Blacksands system Authorizes the User to access the protected Service through its particular Receiver.

Because each User device has a unique Blacksands' Certificate, administrators and stakeholders can vary the Service Authorization based on device specific Certificates.

For instance, policy and governance can be upheld by administrators / stakeholders, in that they may only allow work PCs to access particular sensitive work applications, but home PCs can be permitted to access less sensitive applications.

2.3.3. User / Device Routing

After the Service is selected, a new window or tab opens in the Users' browser. It is automatically populated with the specific, obfuscated, Blacksands' DNS entry associated with the given Service.

When the browser reaches the Receiver, behind which the service resides, the Receiver verifies the identity of the User, once again, by requesting the User's Certificate.

After the Certificate is provided, the Receiver routes the User to the protected Service and sandboxes the User into that specific, single session.

2.3.4. User / Device Heartbeat

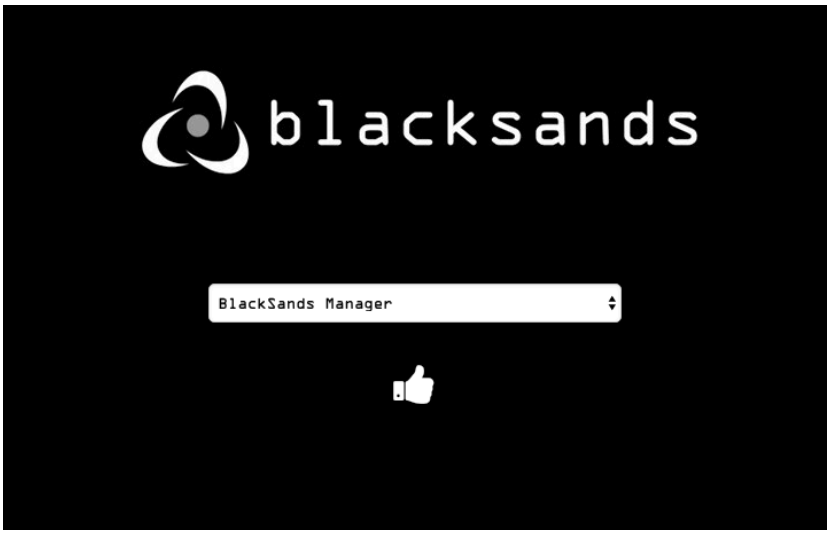
The User must leave the original browser window / tab open while accessing the Blacksands' protected Service/s. As a security measure, in the backgrounds, Blacksands maintains a 'heartbeat'. This 'heartbeat' continually verifies the User's identity and sessions. If, for any reason (hacker, loss of internet connection, computer problems), the heartbeat is interrupted, all of the User's connections to Blacksands' protected Services are instantly severed.

In order to reestablish, a connection, the User must restart the process over from the beginning.

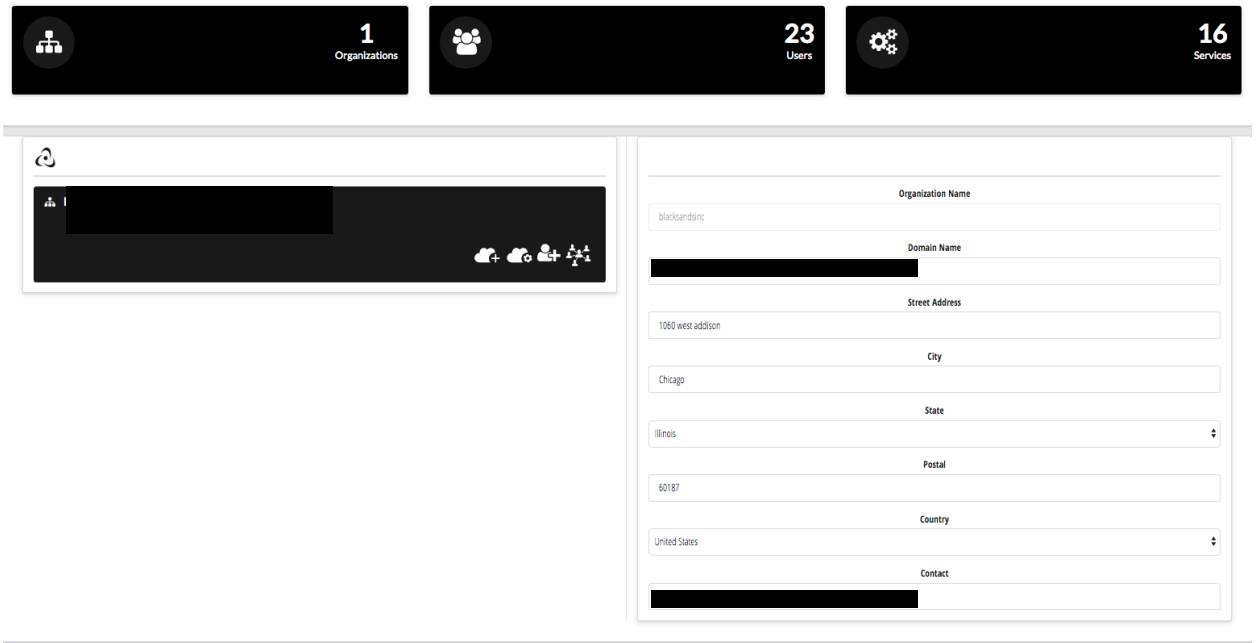
3. Blacksands Manager

3.1. Accessing the Blacksands Manager

To Access the Blacksands' Manager, a Blacksands' User must be either an Administrator or a Stakeholder (See Section 1.2). If the User has either of these Roles, then after the User is Authorized by the Blacksands System (See Section 2.3.2), the User will find the service'BlackSands' Manager' in his/her drop down list. The User selects this Service and the Thumbs Up Button.



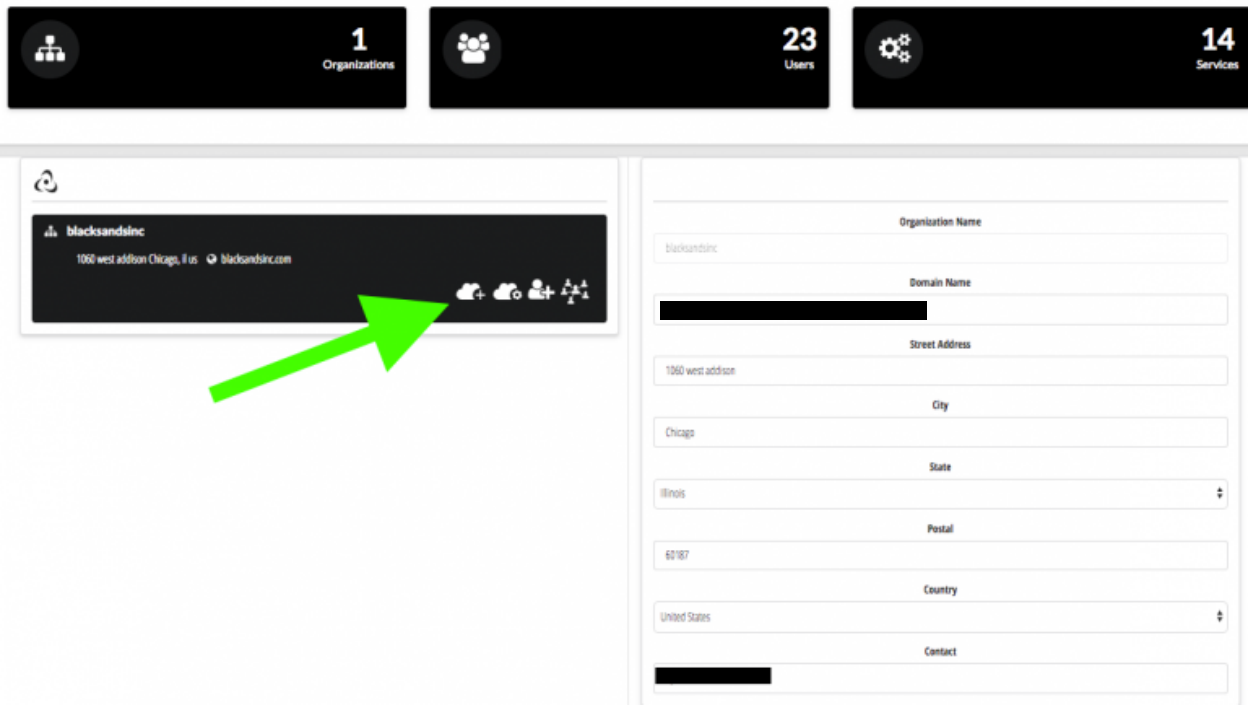
A new window will open and request the User Certificate again. (Certificate Verification occurs for every new Service Connection)



3.2. Managing Services

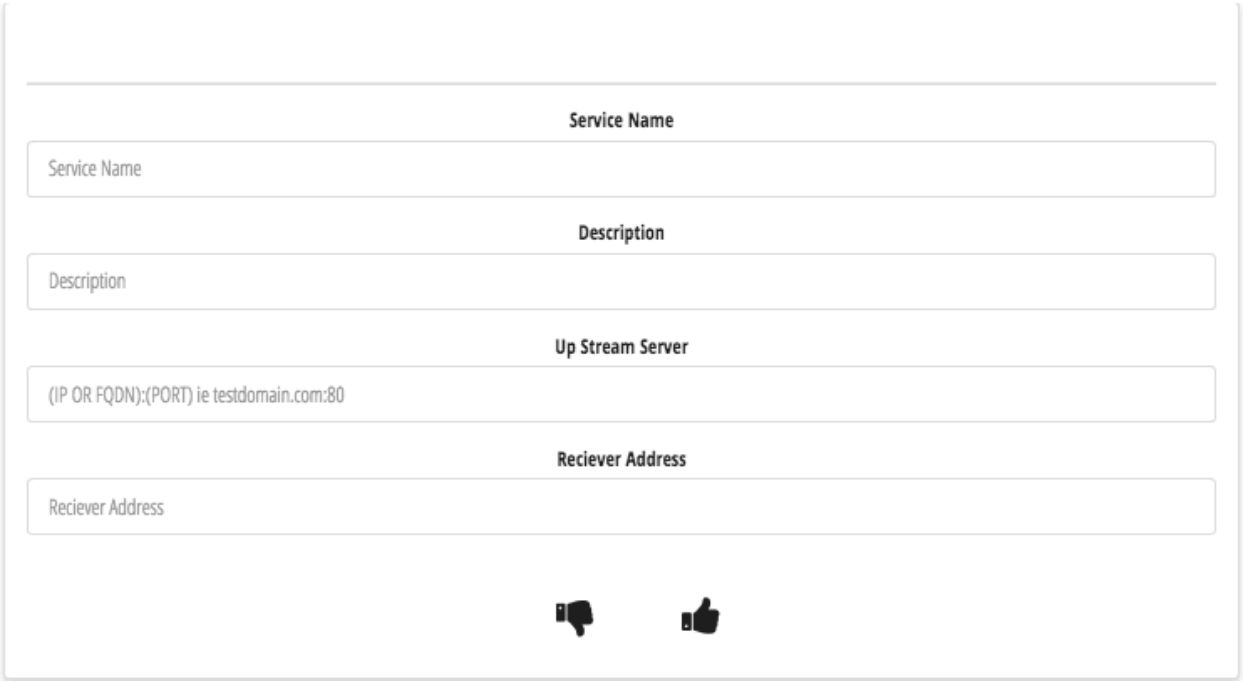
3.2.1. Creating a New Service

A Service can be an HTML Application, PC, or HTML IoT device.
The Service is set up by selecting the Create New Service Icon. (Cloud with the +)



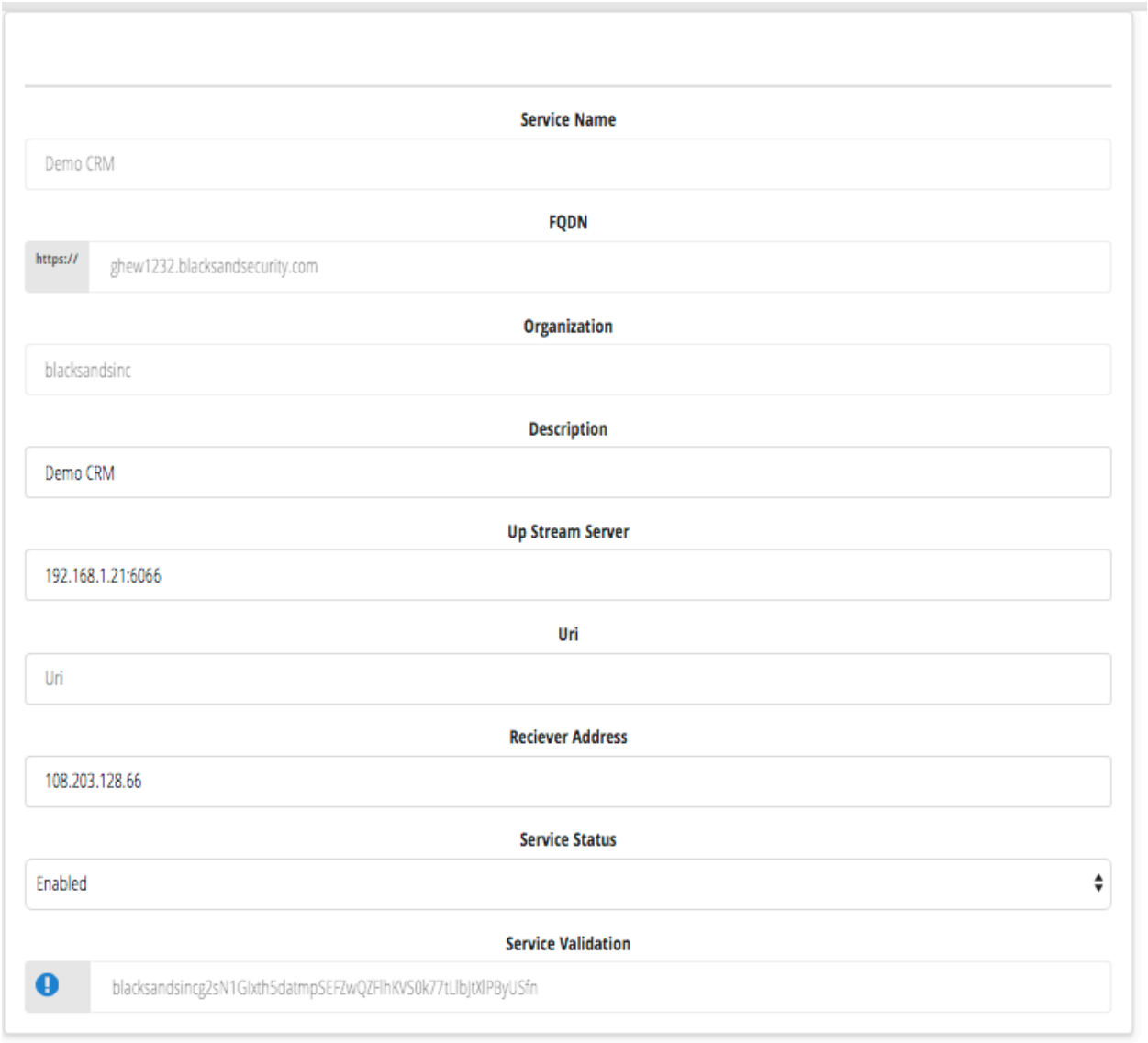
In the right panel are four (4) fields that are used to establish the Service connection.

- **Service Name** – is the common name for the service (e.g. CRM, Robot 4, PC1 in Lab1) This is the name that will appear in the drop down list for the User after authentication.
- **Description** – is an added field for management to add additional information about the Service.
- **Up Stream Server** – is the IP or internal FQDN and Port of the Service. (e.g. 10.10.20.100:21 or abcd.mydomain.com:21)
- **Receiver Address** – is the external IP address that is routed to the Blacksands' Receiver. Most enterprise environments will have the Receiver behind a firewall with an internal IP address and will forward the external IP to the internal IP address. This field is NOT the internal IP, but rather the external IP address that the FQDN will use in conjunction with DNS.
- **Thumbs Up** – After all fields are completed… click thumbs up to initialize/ establish the Service



Once the Service is created the right hand window adds a few fields.

FQDN - Blacksands creates, through and automated process, and registers an obfuscated DNS entry for each Service that is created.
URI - a URI is sometimes required for certain applications. This is application specific and not always required.
Service Status – is a field that appears after initialization which allows an Administrator to Enable or Disable a Service from one place. Disabling a Service from here, will prevent all access to that Service globally, rendering it unavailable to any and all Users, with one click.



3.2.1.1. Creating a New KVM Service

Blacksands utilizes a VNC connection from the back of the Receiver to the target PC. There are two basic PC connection modes:

- **Read Only** – provides the User with near real-time screen visualization. This is does NOT allow the User the ability to upload, download, or modify the PC environment, in any way.
- **Full Access** – provides the User with simultaneous control and visualization of the PC. Control is limited to KVM (keyboard, video, and mouse). The User is not able to upload or download anything into the PC environment directly.

Each mode is a unique Service. This means that a single PC will likely have two (2) Services with unique setups in the Blacksands' Manager (a Read Only and a Full Access), allowing for individual devices to be given different access control

Requirements:

- A PC, like any Service, must be routable from the Blacksands Receiver with port 5900 accessible.
- A PC must have the OS appropriate VNC server installed with the Blacksands' customized profile (.ini file). This profile includes basic information, including the password. This profile can also be the same for all PCs in a given environment (e.g. lab) The profile is available upon request.

Set Up:

In the Blacksands' Manager, select 'Create a New Service' icon and fill out the fields as you would to establish any Service. (for more information on creating a Service – see Create a Service 3.2.1) To delineate between 'Read Only 'and 'Full Access', the Administrator will input the appropriate Uri code.

To create a Read Only PC Service :

/readviewer

(requires the slash '/' before readviewer)

To create a Full Access PC Service:

/fullviewer

(requires the slash '/' before fullviewer)

3.2.1.2. Setting up the Target PC for Blacksands Remote Connection

To enable Blacksands to make a connection to a particular PC the following is required:

- Blacksands' Receiver must have routable network access to the PC
- PC's internal security must allow access from the Blacksands' Receiver
- The PC must have the Blacksands' VNC server installed and running
- Installation requires Admin privileges on the PC

To install the Blacksands' VNC server on a PC:

- Download the VNC server package from the Blacksands' GitHub - https://github.com/blacksandsinc/bsiRDS/raw/master/bsiRDS.zip
- Open a command window
- Navigate to the location of the file downloaded above.
- Uncompress bsiRDS.zip
- cd bsiRDS

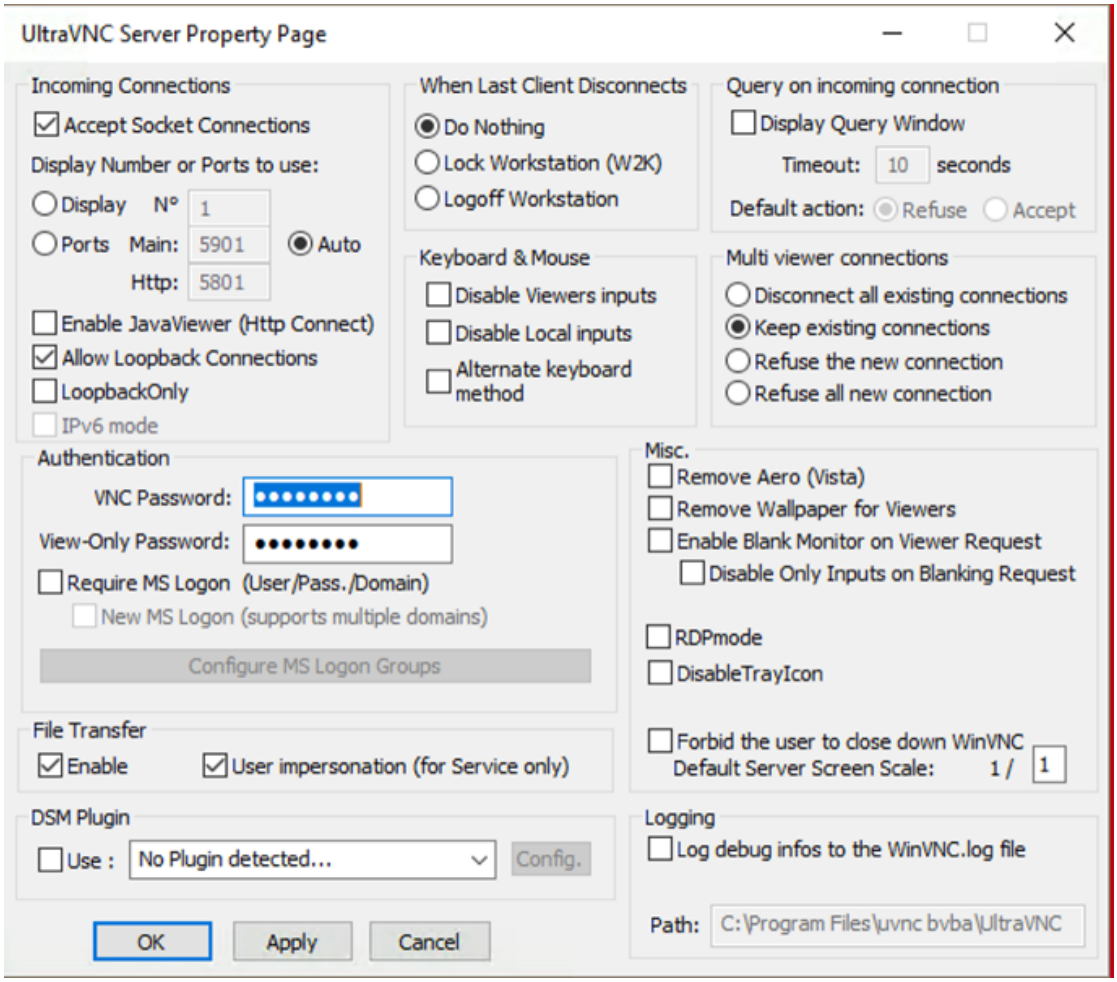
Run the three following commands:

"UltraVNC_1_2_17_X64_Setup.exe" /verysilent / loadinf=UltraVNC_1_2_17_X64_Setup.inf

copy "ultravnc.ini" "%ProgramFiles%\UltraVNC\ultravnc.ini" /Y

"%ProgramFiles%\UltraVNC\winvnc.exe" -install

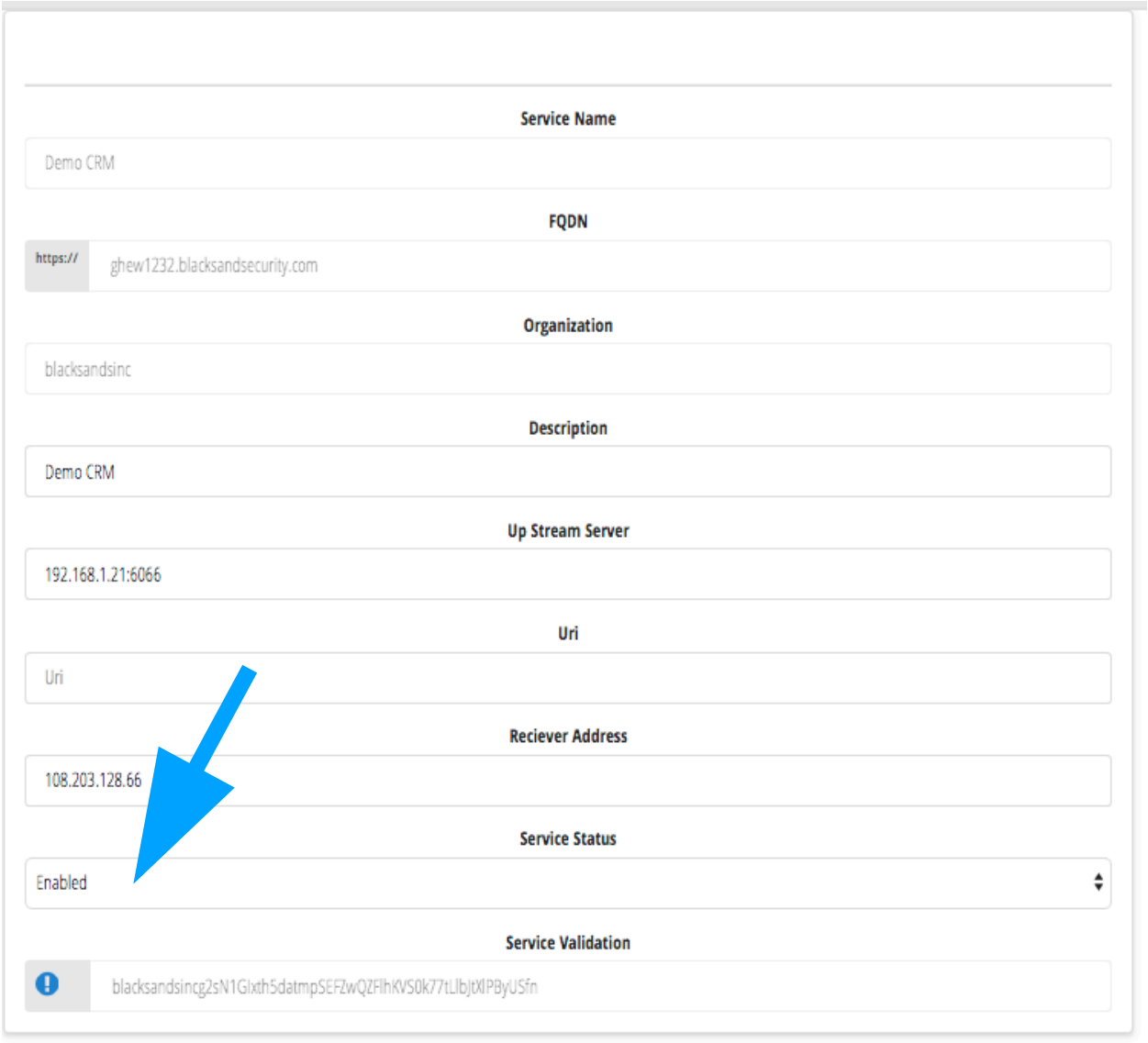
Typical settings are shown below.



3.2.2. Managing Services

3.2.2.1. Enabling / Disabling a Service

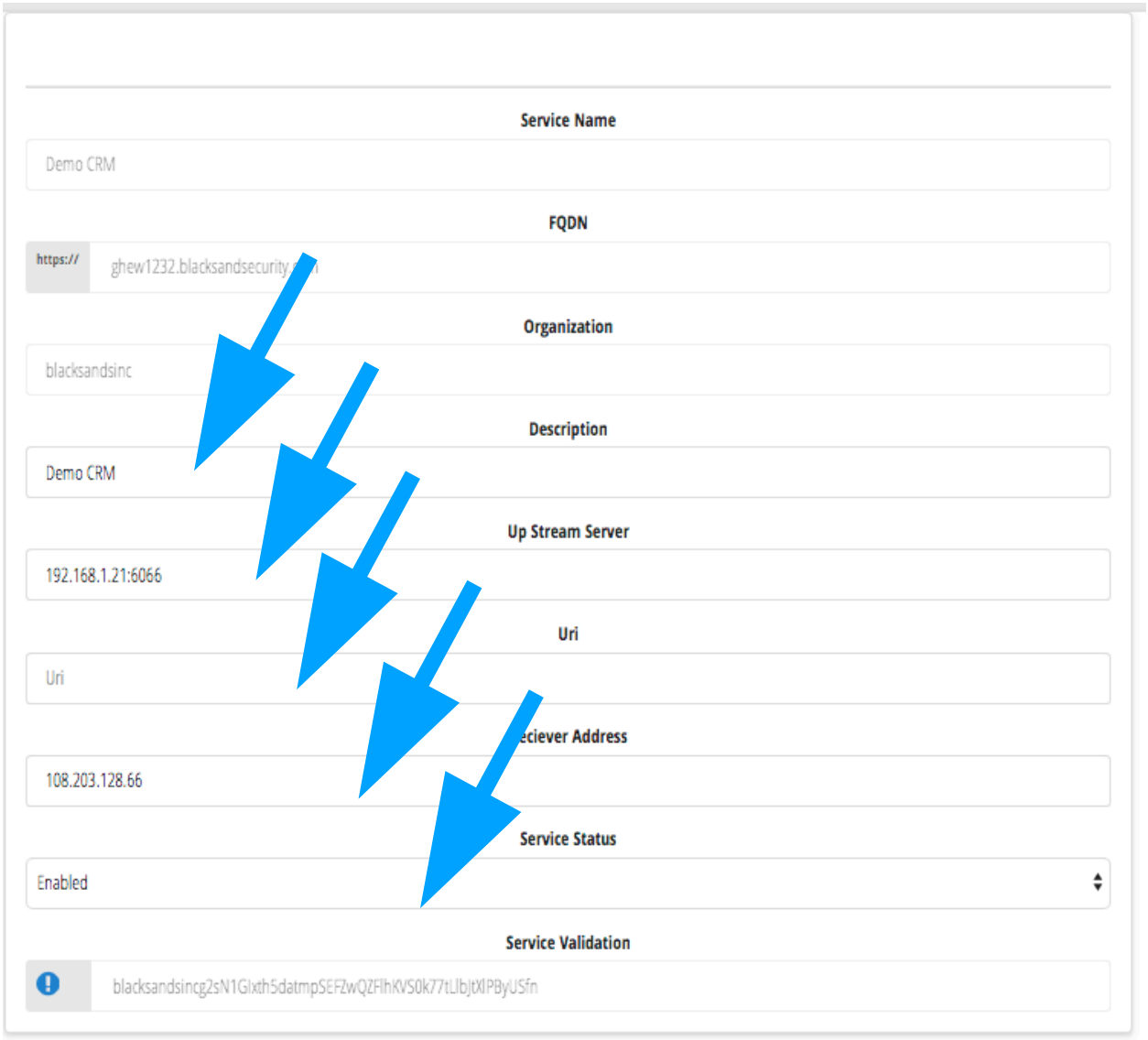
Each Service can be Enabled or Disabled globally, by simply toggling the ‘Service Status’ tab.



3.2.2.2.Modifying a Service

A Service can be modified by simply changing the values in the associated fields. The modifications available are Description, Up Stream Server, Uri, Receiver Address, Service Status.

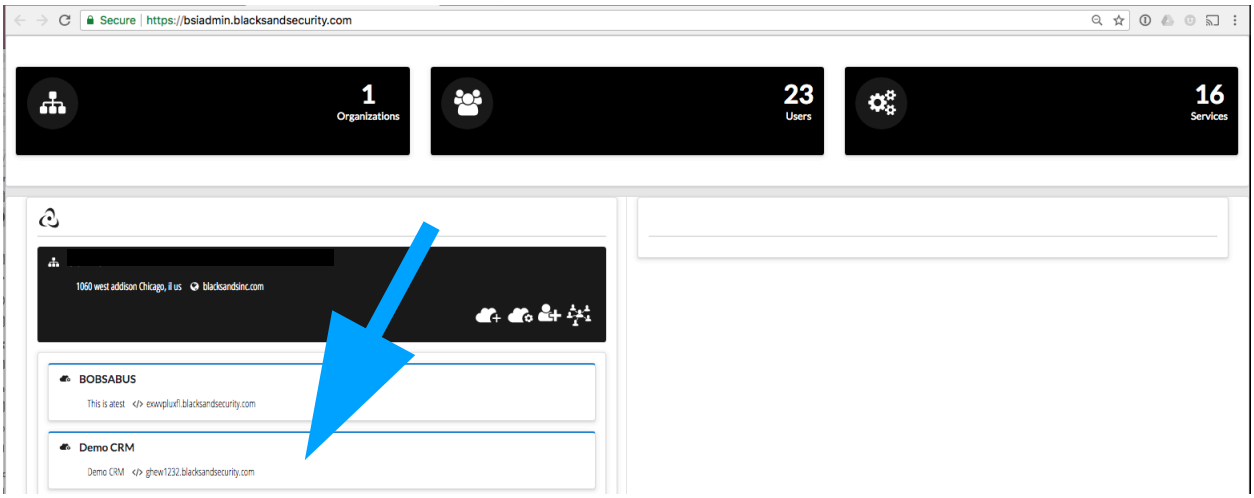
NOTE : Modifying a Service can have adverse effects on its availability.



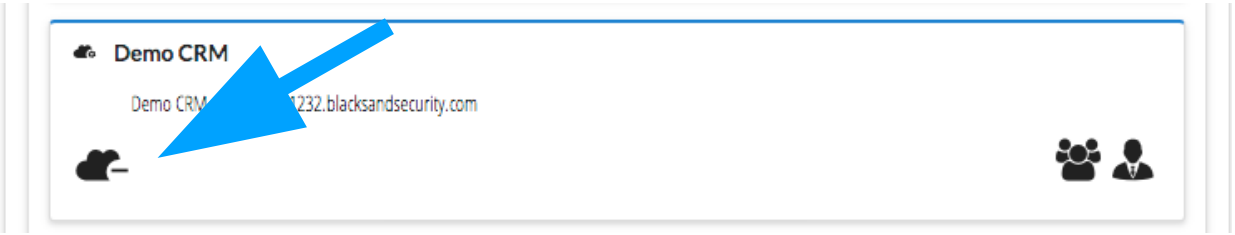
3.2.2.3. Deleting a Service

To Delete a Service:

First select the desired Service on the left side of the 'Blacksands' Manager' under the Organization.



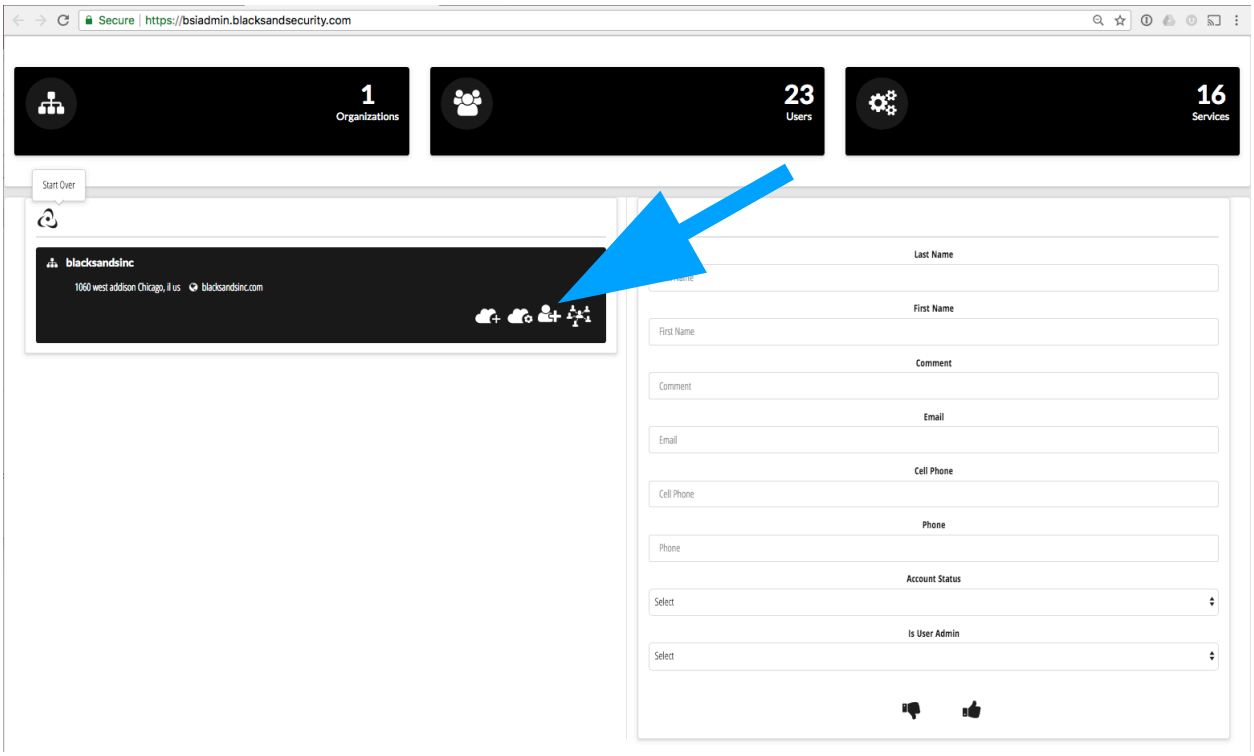
Then, select the Delete icon below the Service Name and Description. This will permanently delete the service, rendering it inaccessible indefinitely to all users. Be sure you desire to make this action permanent as it is not reversible once selected. If this is done and not desired, the Service will need to be reestablished, and all connections to that service reestablished.



3.3. Managing Users

3.3.1. Creating a New User

To create a new User select the Add User Icon on the left window of the Manager. This will open a window to the right with (8) fields to fill.

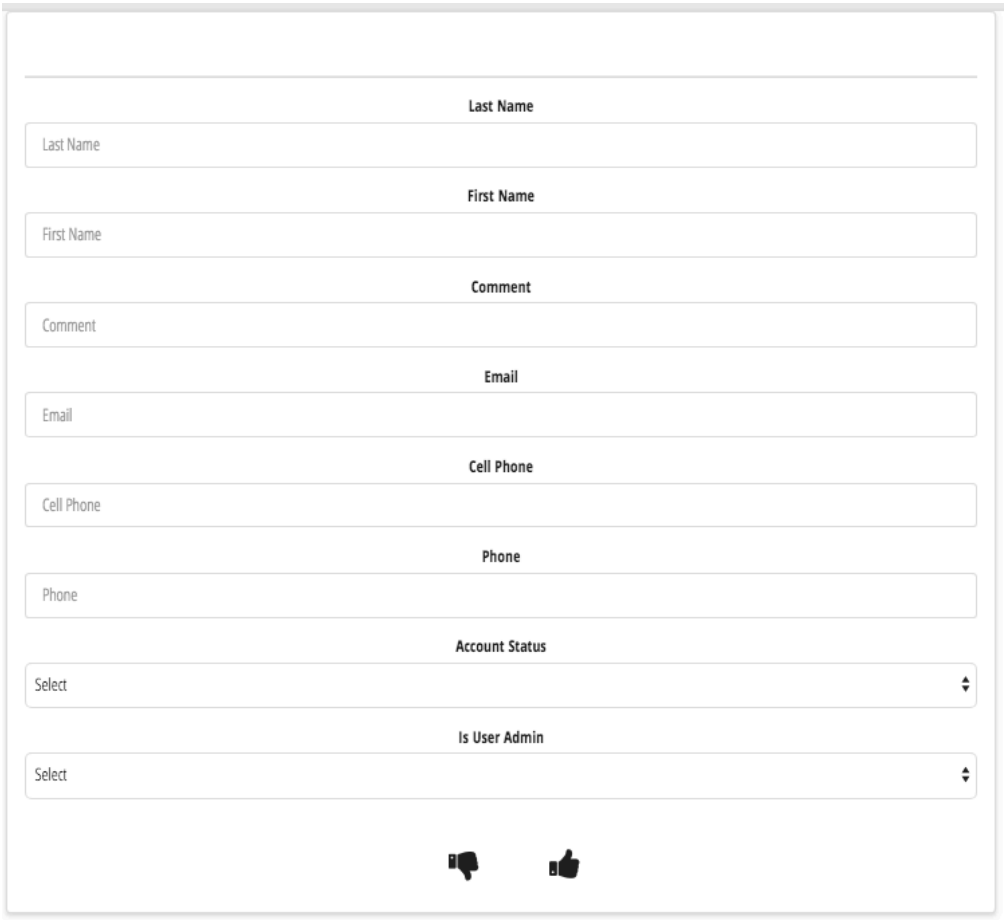


ACCOUNT STATUS

The 'Account Status' field provides a single point to manage an individual's device and their global access. If an Administrator Disables a User / Device account, the Certificate associated with that User and Device will not be able to access any Blacksands' protected Service. By changing this status back to Enabled, the User's Device will be reinstated along with the authorized Services associated with that Device.

IS USER ADMIN

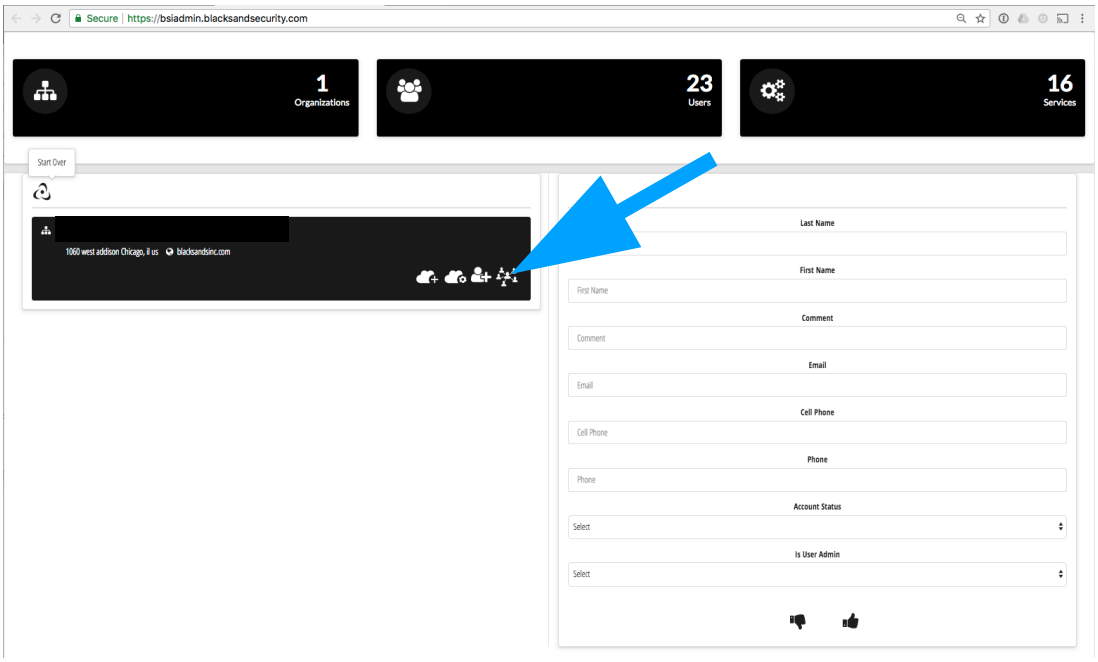
The 'Is User Admin' field identifies the particular User and Device associated by its unique Blacksands' Certificate as an Administrator. When set to 'True' the User and the associated Device with its associated Certificate can access the Blacksands Manager as an Administrator with full Administrator rights.



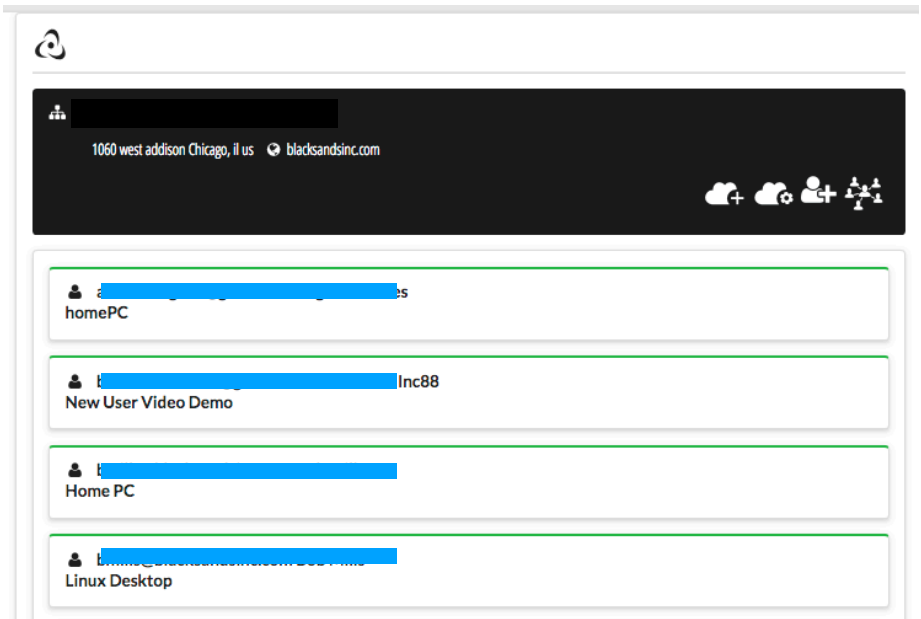
Once all the fields are appropriately filled, select the Thumbs Up icon. The new User will receive an email, at the address provided, to begin the registration process.

3.3.2. Modifying a User

Select the Show Users Icon in the left window.



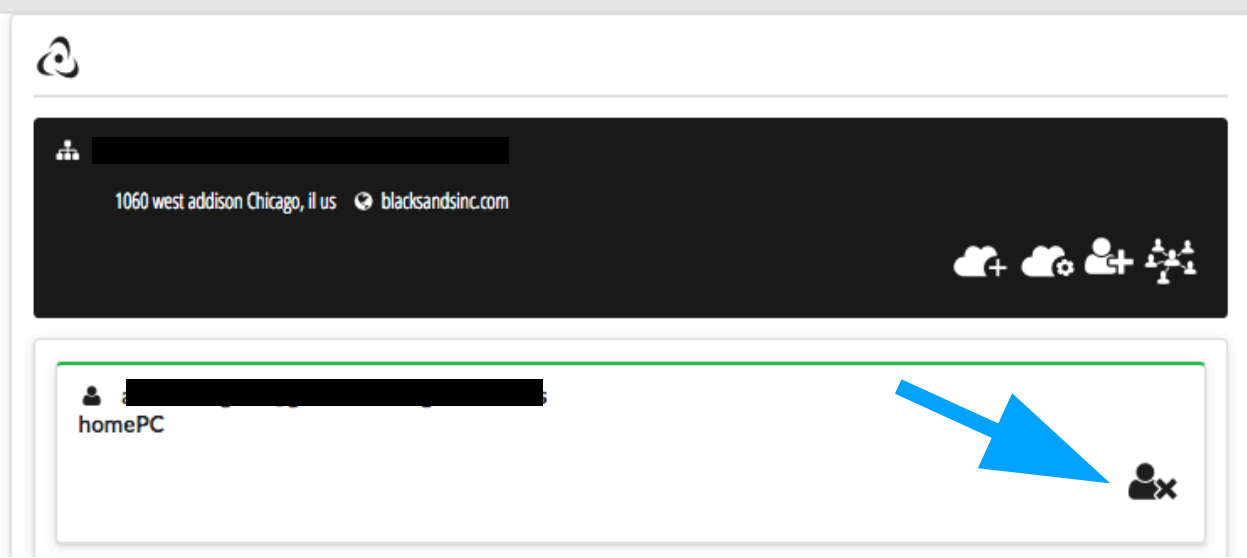
This will produce a list of all Users and their associated Devices.



When a particular User / Device is selected, the right window shows the specific information associated with that User / Device. An Administrator can modify any of the fields at any time.

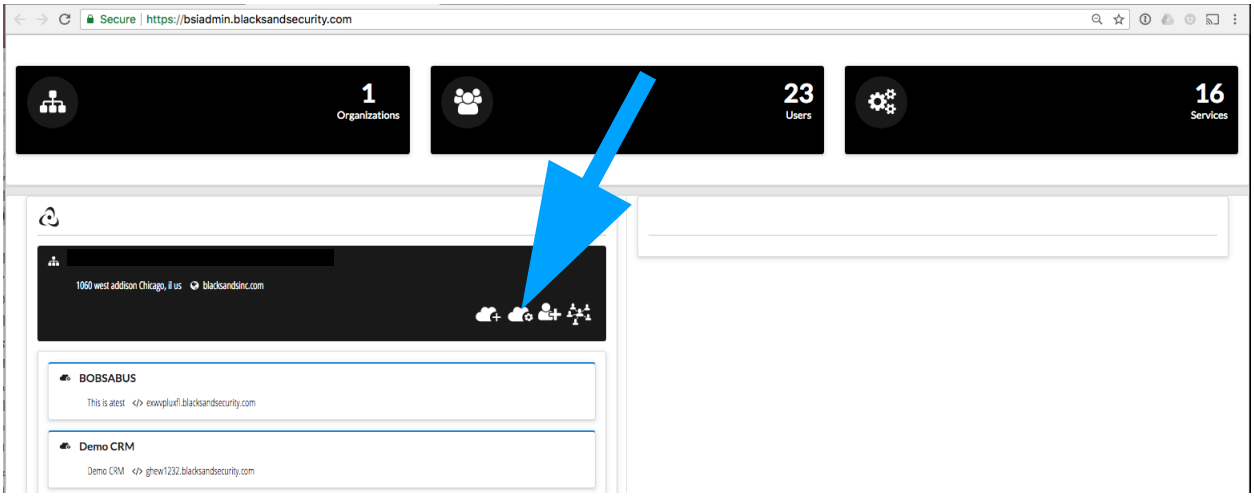
3.3.3. Deleting a User

When particular User / Device is selected the delete icon is available in the right side panel. An Administrator can permanently delete the associated User / Device by selecting the Delete icon. This action is not reversible. If this is selected and not desired, a new invitation will need to be generated (new user registration redone) and access to all services will be required to be setup again.

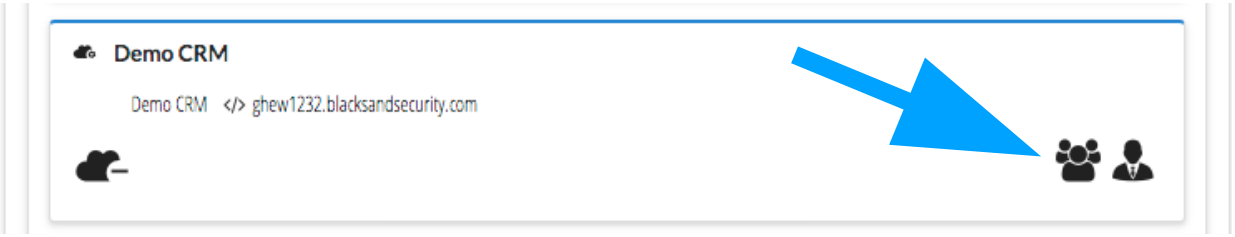


3.3.4. Adding a User to a Service

An Administrator or a Stakeholder can add a User to a Service. First the Administrator or Stakeholder selects the 'Show Services' icon and then selects the specific Service to which he/she would like to add a specific User/Device.



Then Administrator or Stakeholder selects the 'Show Service Members' icon.



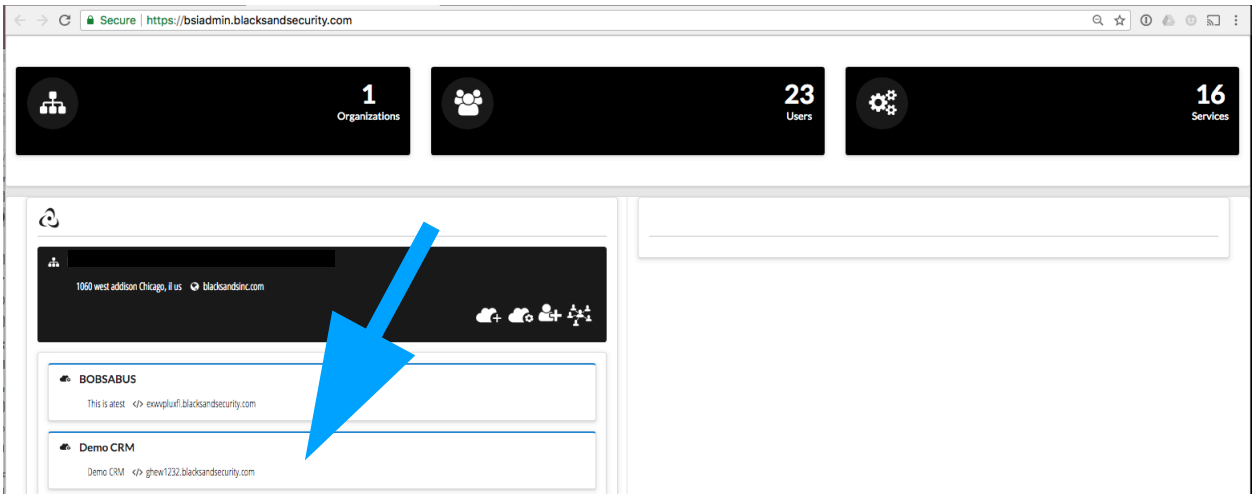
A new window opens with two lists - 'Not In Service' and 'In Service'. To enable or revoke access for a specific User / Device to/from a specific Service, the User / Device is selected and the appropriate arrow at the top of the window is selected. Once the User / Device turns green the move is complete.

3.3.5. Adding a Stakeholder to a Service

Stakeholders are similar to Administrators as they have access to the Blacksands' Manager. However, a Stakeholder is limited in his/her functionality. Stakeholder access to any Service can only be granted by an Administrator.

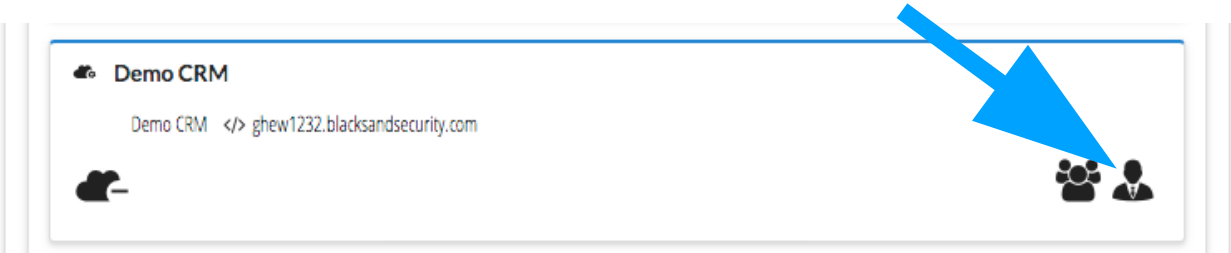
When a User / Device is designated a Stakeholder for a specific Service, then that User / Device will be able to manage other User's access to that particular Service. The Stakeholder is also provided the ability to Modify the Service fields. The Stakeholder cannot Add, Delete, or Modify Users. Nor can the Stakeholder Add or Delete Services.

A Stakeholder is restricted to only managing User access to the specific Service/s they are Stakeholders for. A Stakeholder can be a member of other Services as well.

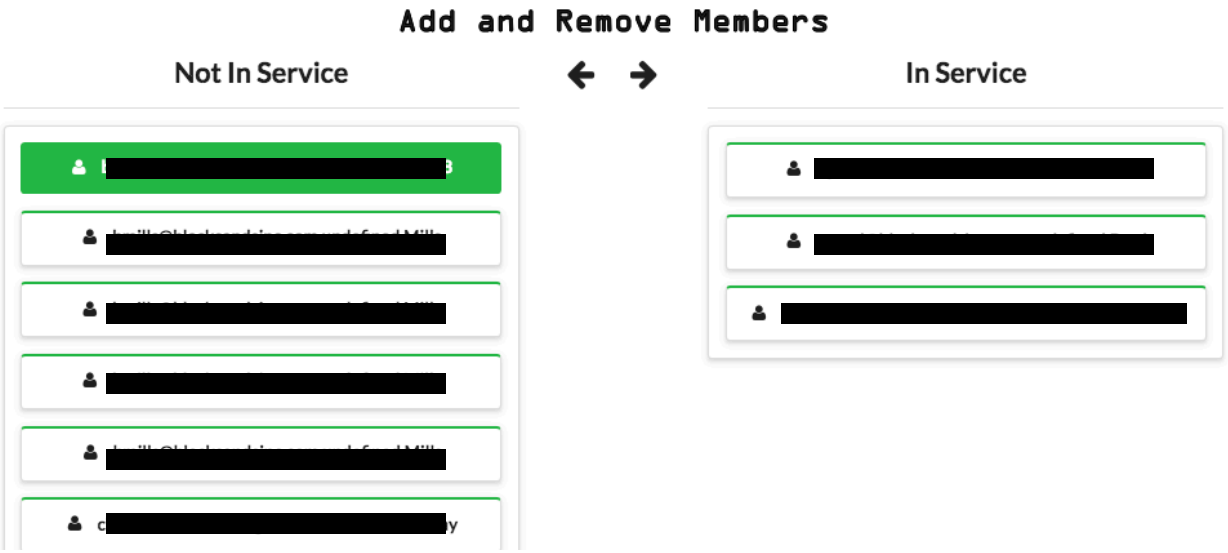


To Add a Stakeholder to an existing Service, a Blacksands' Administrator selects the particular Service.

Then the Administrator selects the 'Show Stakeholder Management' icon.



A new window similar to the 'Add Users to Service Window' opens. The Administrator selects the particular User / Device selects the right arrow and adds that User / Device to the 'In Service' list. Once the User / Device turns green the Stakeholder access is granted. Similarly, an Administrator can remove a Stakeholder by selecting the User/ Device from the 'In Service' list and selecting the left arrow. The User / Device is moved to the 'Not In Service' list and when it turns green the Stakeholder access is revoked.



When the User and associated Device (now Stakeholder) accesses the Blacksands' Authorizer a new Service appears in their drop down list of Services: 'BlackSands Manager'. The Stakeholder will only see Services that he/she has the ability to manage within the Blacksands' Manager Service.

4. Deploying Blacksands Receiver (Virtual Machine)

4.1. Virtual Machine Requirements

In order for the rapid and effective installation of the Blacksands' Receiver the following requirements must be met:

(Company Provides)Company network accessible

- HTML application/s
- Web Accessible IoT Device/s
- Windows Test Equipment PC/s with accessible port: 5900

VMWare ESXi 6.5+ VMWare Virtual Center 6.5+

Hardware

Processor should be one of the following combinations:

- Four(4) Sockets
- Two(2) Sockets Two(2) Cores
- Four(4) Cores

Ram:

- Four(4) GB (4096 MB) Ram
- Storage:80 GB Virtual Hard Drive

Network Rules: Inbound

External IP should be able to initiate request to VM: from Blacksands – 67.225.220.203 to Receiver External IP(xxx.xxx.xxx.xxx):Port 22 & Port 443

Network Rules: Outbound

VM should be able to initiate requests to IPv4 IP:
Address 91.189.91.23 Port 80 and 443 TCP (software/security updates)
Address 91.189.91.26 Port 80 and 443 TCP (software/security updates)
Address 91.189.88.162 Port 80 and 443 TCP (software/security updates)
Address 91.189.88.161 Port 80 and 443 TCP (software/security updates)
Address 91.189.88.149 Port 80 and 443 TCP (software/security updates)
Address 91.189.88.152 Port 80 and 443 TCP (updates) Port 123 UDP (NTP)
Address 74.125.69.108 Port 587 TCP (Device Registration)
Address 74.125.69.109 Port 587 TCP (Device Registration)
Address 67.225.220.110 Port 443 TCP (Device Registration)

Address [DNS Server (i.e. Google 8.8.8.8)] Port 53 TCP/UDP (DNS)
Address 67.225.220.131 Port 5680 (Blacksands bus)

4.2.Downloading Receiver VM (Virtual Machine)

Download VM From given URL:
https://s3.amazonaws.com/OVA-BS/BlacksandsInc_Reiviever_v2.4.zip

Log into your VMWare Web Console, this demonstration will be using VMWare ESXi 6.5.0

Unzip the file BlacksandsInc_Receiver_v2.4.zip and a new directory will be created:

- BlacksandsInc_Receiver_v2.4
  - BlacksandsInc_Receiver_v2.4.ova
  - sha256sum.exe
  - sha256.sha

Verifying Download

To check the file hash please do the following:

OSX:

in command window cd into BlacksandsInc_Receiver_v2.4 execute the following command

shasum -c sha256.sha

Windows:

In command window cd into BlacksandsInc_Receiver_v2.4 execute the following command

sha256sum.exe -c sha256.sha

4.3. VMWare ESXi 6.5.0 Example

Select ***Create / Register VM***, select ***Deploy a virtual machine from OVF or OVA files*** then click ***Next*** (see Diagram 1.)

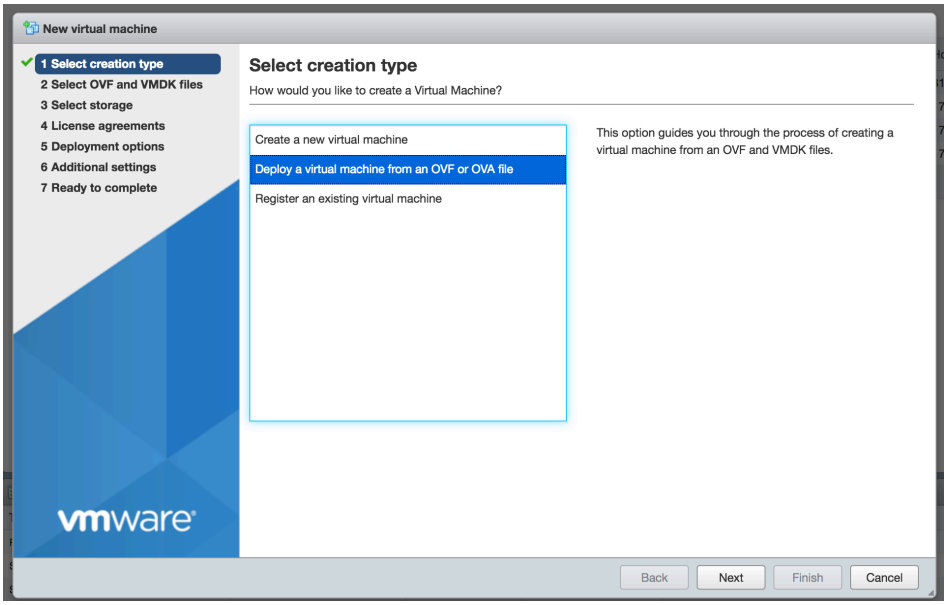


Diagram 1

Add ***Name*** and ***drag*** the ***BlacksandsInc_Receiver_vXX.ova*** into the ***blue box*** and click ***Next*** (see Diagram 2.)
Select ***Storage*** and click ***Next***

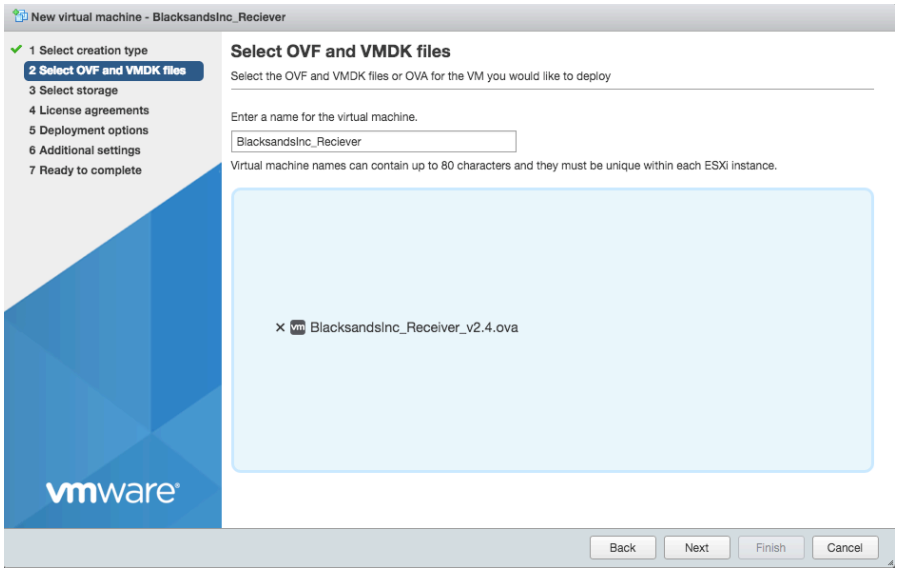


Diagram 2

Select ***Deployment Options*** and click ***Next***

Review the settings and click ***Next*** at ***Ready to complete*** (see Diagram 3.)

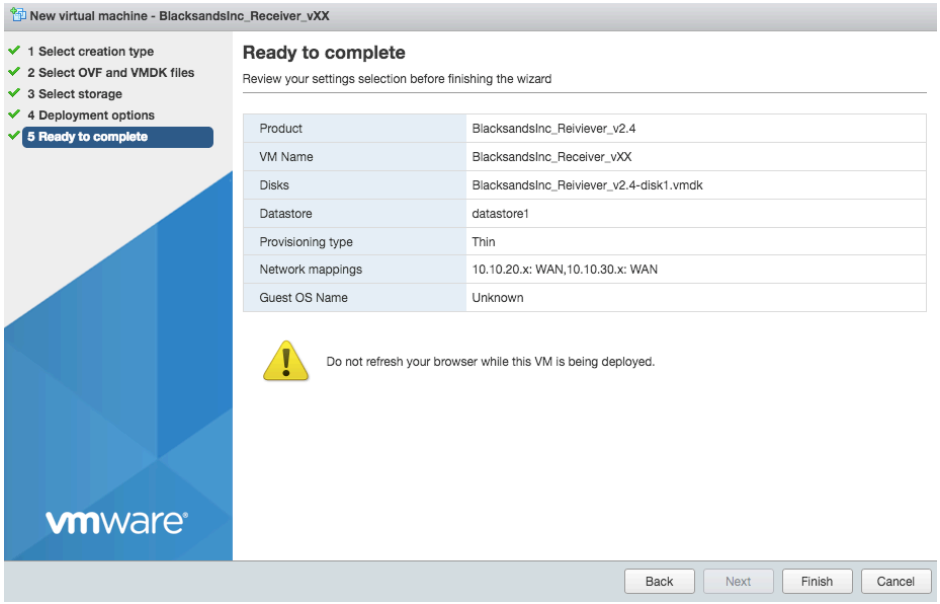


Diagram 3

4.4. Registering the Blacksands Receiver

Power On the newly created VM.

Start a ***console*** to the VM.

If you experience the following Error:
'SSE 4.2 Instruction Set Not found'
Please see Appendix A for instructions and Blacksands Non-SSE4_2 Receiver Download process.

Logging on the Blacksands' Receiver (Console)

Username = bsiuser
Password = 1234567890
Blacksands terminal user from the VMWare console window log into the Blacksands console with the above information. You will be immediately forced to change the default password.

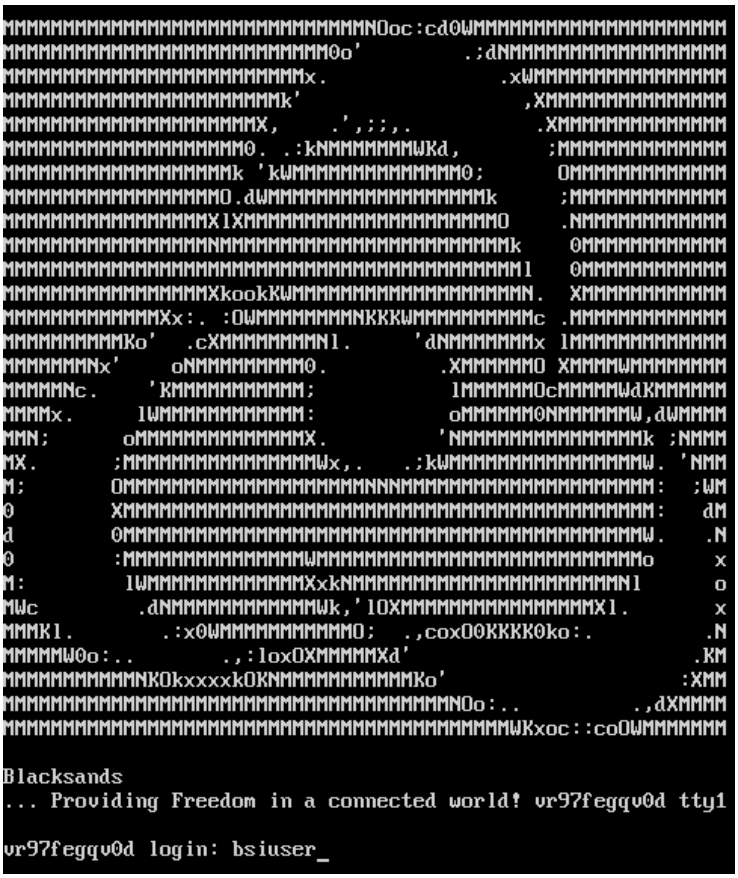


Diagram 4

4.4.1. Accessing bsiuser Tools

Hit 'TAB' a couple of times to see a list of available tools. (adapters, arp, registration, restart, set, shutdown, speedtest)

```
bsiuser@config:~#
adapters        registration    set             speedtest
arp             restart         shutdown
bsiuser@config:~#
```

4.4.2. Setting up Networking

The initial settings are WAN0 - DHCP and LAN0-3 DISABLED

The first change will be to setup networking for WAN0

Type 'set' and then hit 'TAB' . This will provide you with the the different 'set' functions available.

```
bsiuser@config:~# set
lan0  lan1  lan2  wan0
```

Type 'set wan0'

```
bsiuser@config:~# set wan0
Please select dhcp or static or off
[dhcp/static/off/back]: static
IPv4 Address: [redacted]
IPv4 Subnet Mask: 255.255.255.248
IPv4 Gateway: [redacted]
Please enter DNS seperated by spaces
IPv4 DNS: 8.8.8.8
```

Then input the appropriate networking information including; Address, Subnet, Gateway, and DNS.

You can also set one of the LAN interfaces for the internal network in the same way.

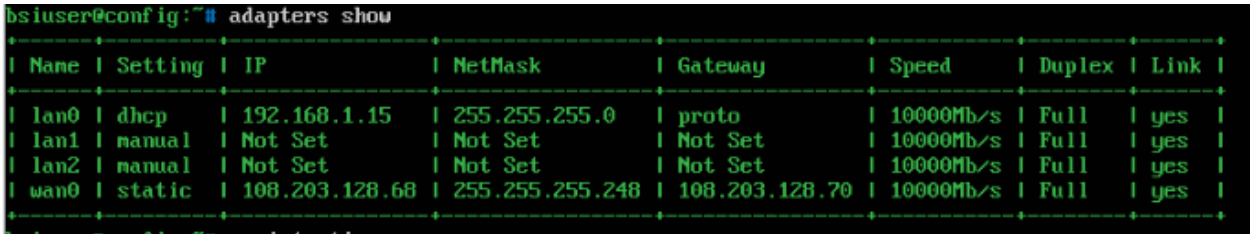
Anytime you adjust networking on the Receiver, the device will need to be restarted for the changes to take effect.

4.4.3. Restarting Receiver

Type ‘restart’ in order to force the rebooting of the Receiver.
You will be required to confirm this request.

4.4.4. Viewing Network Adapters

In order to view WAN0, LAN0-3 you can view the current adapter settings. Type ‘adapters show’ and it will list the current settings.



4.4.5. Registering a Receiver

In order for a Blacksands’ Receiver to connect to the Blacksands’ infrastructure and be available for an organization to use, an automated Registration and Provisioning Process must occur.

The ‘registration’ option has three sub-functions: ‘complete’, ‘reset’, and ‘start’,

4.4.5.1. Starting the Registration Process

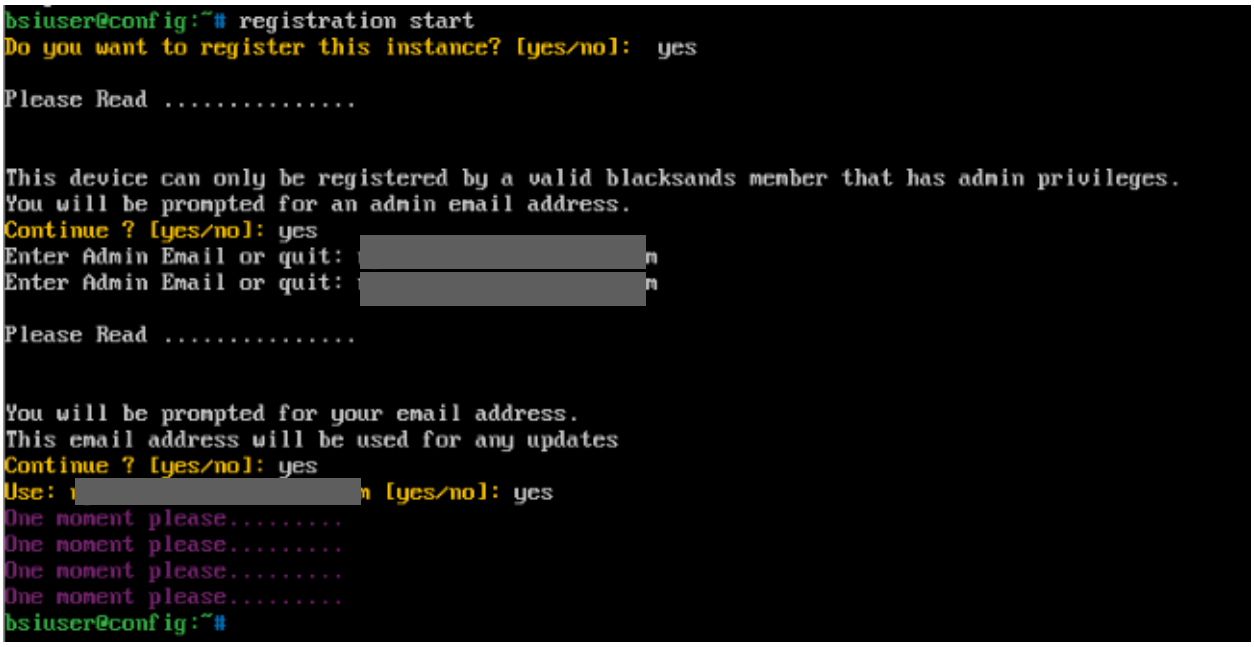
Type ‘registration start’. You will be prompted to confirm the registration of this Receiver. Note, that this resets the Receiver in the system. This also REQUIRES proper networking. We suggest utilizing some of the other networking tools prior to Registering the Receiver (i.e. ‘arp’, ‘speedtest’, ‘adapters’)

4.4.5.2. Setting Emails for the Registration Process

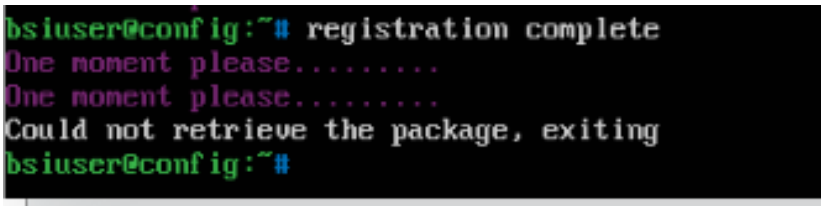
You will be asked for two emails.

The first is an 'Admin Email'. This is a member of your organization that is already a valid Blacksands' Administrator. He/she will receive an email requesting approval of this Registration process for your organization.

The second email is your email (the person installing the Receiver). This email address will be used to report on any changes to the Blacksands' Receiver. These 2 email addresses may be the same for a given organization.



The Registration process may take a few minutes. If you receive a 'Could not retrieve the package, exiting' error. Wait a few minutes and try again.



Once the Registration Process is complete, the following message will be displayed and the Blacksands' Receiver is ready for use.

5. Event Logs

5.1. Overview

Blacksands Receiver provides two types of logs, network logs and Receiver local application logs. Receiver local application logs consists of Action and Request logs.

5.2. Definitions

Kernel syslog facility - a standard for message logging. It allows separation of the software that generates messages, the system that stores them, and the software that reports and analyzes them. Each message is labeled with a facility code, indicating the software type generating the message, and assigned a severity label.

Blacksands log Facility - JSON string using the ISO 8601 date time format

Action logs - events that occur between Receiver and Manager

Request logs - events that occur between User and Receiver

5.3. Explanation

Network logs come from the Kernel syslog facility and follow two rules, allowed or blocked (see diagram 1)

```
May 11 14:17:32, ALLOWED IN=wan0 OUT= SRC=x.x.x.x DST=x.x.x.x LEN=191 TOS=0x00
PREC=0x00 TTL=53 ID=0 DF PROTO=TCP SPT=51158 DPT=443 WINDOW=7987 RES=0x00 ACK PSH
URGP=0

May 11 10:33:58, BLOCKED IN=wan0 OUT= SRC=x.x.x.x DST=x.x.x.x LEN=40 TOS=0x00
PREC=0x00 TTL=240 ID=46520 PROTO=TCP SPT=6666 DPT=443 WINDOW=1024 RES=0x00 SYN URGP=0
```

EXAMPLE OF NETWORK KERNEL LOG ENTRY
DIAGRAM 1

Blacksands Action and Request logs are processes by the Blacksands Log Facility.

Diagram 2 shows the events to be processed by the Receiver from the Manager.


```
2018-03-28 10:51:40,013, TYPE:INFO, MSG:"{"hash": "/UID=1111-2222-3333-4444-
5555/CN=tjones-1234:SERIAL", "upstream": "x.x.x.x:1234", "request": "add", "fqdn":
"abcdefg.blacksandsecurity.com", "ip": "x.x.x.x"}"

2018-03-28 11:03:43,103, TYPE:INFO, MSG:"{"hash": "/UID=1111-2222-3333-4444-
5555/CN=tjones-1234:SERIAL", "request": "rm-all", "ip": "x.x.x.x"}"
```


ACTION EVENTS DIAGRAM 2

Diagram 3 shows the events being processed between the User and Receiver.

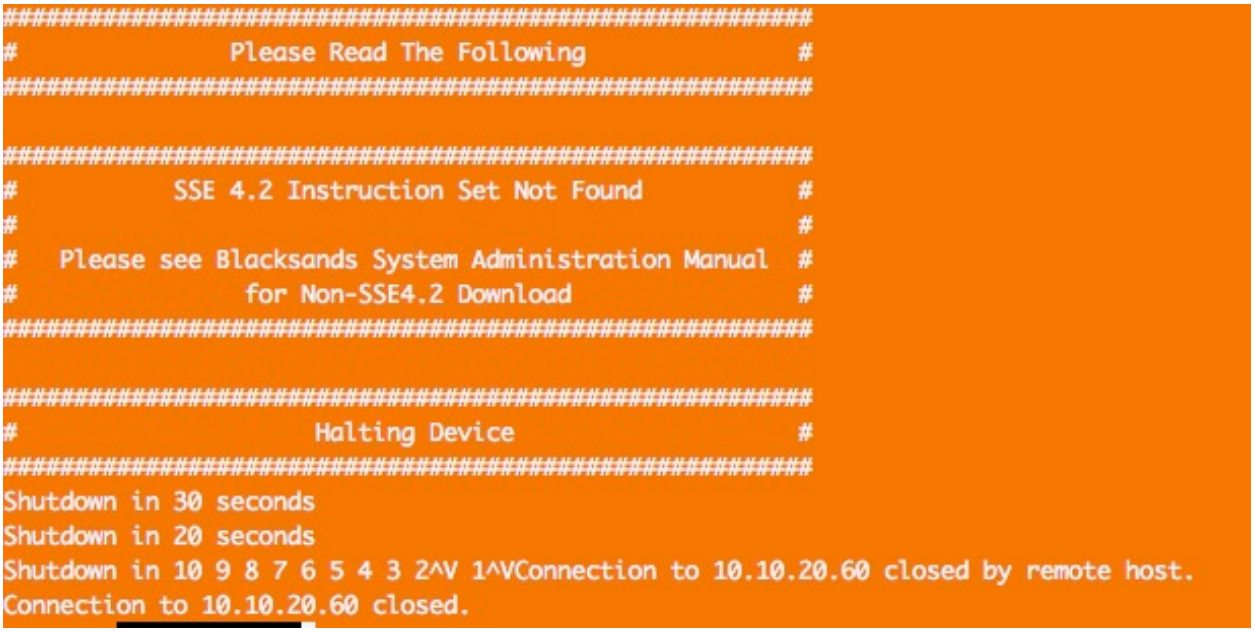

```
2018-03-28 11:03:43,103, MSG:"{"host": "x.x.x.x", "status": "101", "request": "GET
/websockify HTTP/1.1", "size": "14858031", "subject": "/UID=1111-2222-3333-4444-
5555/CN=tjones-1234", "serial": "1234", "server": "abcdefg.blacksandsecurity.com",
"be": "x.x.x.x", "b": "585.397", "ber": "585.397"}"
```


REQUEST EVENT DIAGRAM 3

Blacksands can work with a customer in setting up Blacksands Parsers within the customer SIEM or log collector.

Appendix A - Error Message: 'SSE 4.2 Instruction Set Not Found'

Possible error message occurring during Blacksands Receiver download:
If your system is running a version of VM ware that does not have a necessary SSE4_2 Instruction Set, the following error message will be displayed.



If this Error Message is displayed, please use the following to download a Blacksands Non-SSE4_2 Receiver.

https://s3.amazonaws.com/OVA-BS/BlacksandsInc_Receiver_v2.5_nosse42.zip

This version of the Blacksands Receiver has one extra step when deploying it within a VMWare environment. After importing the OVA file into VMWare, log in with the ***bsiuser*** account and set the password (from ***1234567890*** to something you choose). Once at the command screen please restart the Blacksands Receiver (by typing the following command "***restart***"). After that point you can follow the steps within the manual.

Record of Changes

Revision Level	Section	Change Description	Date	Comments
1.2.2	4.1	Change	14 June 2018	Changed VM version requirements to ESX 6.5
1.2.3	4.2	Add	21 June 2018	Add error message for missing SSE 4_2 in VM Download and fix - Appendix A