VOSS Automate
NBI Install Guide

Release 24.1

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Legal Information

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Contents

1. Introduction

1.1. Overview

VOSS Automate ships with a portfolio of service integration modules to support close working with associated provider OSS and BSS systems. Within this portfolio, VOSS Northbound Integration Module (NBI) offers integration with northbound systems for billing and reporting purposes. NBI is a module for VOSS Automate and provides functions to control the billing flow during initial customer provisioning, monitor for changes to subscribers or their services once the customer is live, and issue real-time billing updates (payloads) northbound for charging.

NBI runs as a separate appliance and provides this integration with northbound systems through a near real-time RESTful API. This interface is used to transfer a billing payload that contains information on subscribers and associated services and devices whenever a change is made to the live system.

This document describes how to install the NBI application and then connect it up to VOSS Automate and a northbound system.

Note: This version of NBI is compatible with VOSS Automate version 19.x.

Following the installation of NBI, configure the following parameters as required:

- SNMP alerts

1.2. Before You Start

A set of configuration details and a number of requirements should be met before installation takes place.

1.2.1. General Requirements

Northbound System Support should be available for SSL configuration and the web service URL.

1.2.2. Hardware Requirements

Node Type	Quantity	VM	Memory	CPU	Disk	Network
Generic	1	>= VMware 5.1	4GB with 4GB Reservation	2vCPU @ 2Ghz With 4Ghz Reservation	80 GB	1 Gbit/s minimum

2. New Install for NBI

2.1. Software Details

2.1.1. Software Details

Download Location

Table 1: Download Location

Server	https://voss.portalshape.com
Location	Downloads > VOSS NBI > [version]

Software Files

Table 2: Software File Details

File Name	platform-install-[version].ova
SHA256 Checksum	[checksum]
File Name	NBI-[product-version].script
SHA256 Checksum	[checksum]

Documents

Table 3: Document Details

Install Guide	Install-NBI-[version].pdf
Release Notes	Release-Notes-NBI-[product-version].pdf

2.2. Download Relevant Files

2.2.1. Download the Relevant Files

Refer to your VOSS Support representative for the following files:

1. NBI new install OVA based on the latest version of VOSS Automate:
   a. `platform-install-<version>.ova`.

   Download or copy to a directory accessible by the VM client.
2. NBI Install Script:
   a. `NBI-<name>-<version>.script` where <name> is relevant to you and <version> is the NBI version to be installed.

   Download or copy to a directory accessible by the VM client.

Important: Template definitions are **not required** if the corresponding VOSS Automate was integrated with a previous version of NBI.

2.3. Pre-Checks

2.3.1. VOSS Automate verification

Important: One or more verification steps require root access to VOSS Automate. These steps must be carried out by VOSS Support.

If working with a cluster

- Verify Primary and Secondary Nodes

  ```
  database config
  ```

- Verify cluster connectivity

  ```
  cluster status
  ```

- Verify network connectivity, disk status and NTP

  ```
  cluster check
  ```

- As **root user** verify port 27020 is open to NBI on TCP/27020 on all Unified Nodes by reading the current firewall rules

  ```
  /opt/platform/apps/cluster/cluster.py run application "config.py get /apps/mongodb/
  firewall/mongodb/all"
  ```

- If not, as **root user** open TCP/27020 on all Unified Nodes to NBI by creating the firewall rule replacing <NBI IP> with the IP address of the NBI instance

  ```
  /opt/platform/apps/cluster/cluster.py run application "config.py put /apps/mongodb/
  firewall/mongodb/all all:tcp.27020.0#<NBI IP>"
  ```

To check access to the database, use netcat to test the connection to the VOSS database from the NBI machine, replacing <VOSS IP> with the IP address of the VOSS instance:

```
diag test_connection <VOSS IP> 27020
```

A system message confirms whether the connection is successful.

You can then recheck the firewall rules again on the VOSS instance:

```
config.py get /apps/mongodb/firewall/mongodb/all all:tcp.27020.0#all
```

- Copy the DB Password (root)

  ```
  /usr/bin/rest --get --path=/apps/voss-deviceapi/config/seed --value
  ```

If the server is a single node:

- Check all services are up:

  ```
  app status
  ```

- Copy the DB Password (root)

  ```
  /usr/bin/rest --get --path=/apps/voss-deviceapi/config/seed --value
  ```

- As **root user** verify port 27020 is open to NBI on TCP/27020 by reading the current firewall rules

  ```
  config.py get /apps/mongodb/firewall/mongodb/all all:tcp.27020.0#all
  ```

- If not, as **root user** open TCP/27020 to NBI by creating the firewall rule replacing <NBI IP> with the IP address of the NBI instance

  ```
  config.py put /apps/mongodb/firewall/mongodb/all all:tcp.27020.0#<NBI IP>"
  ```

To check access to the database use netcat to test the connection to the VOSS database from the NBI machine, replacing <VOSS IP> with the IP address of the VOSS instance:

```
diag test_connection <VOSS IP> 27020
```

A system message confirms whether the connection is successful.

You can then recheck the firewall rules again:

```
config.py get /apps/mongodb/firewall/mongodb/all all:tcp.27020.0#all
```

Ensure the database model files (schemas) for a *new install only* are added via he GUI - these are the files in the Download section above and are added under the Administration - Import section.

Add an NBI user to the VOSS Automate GUI:

Note: NBI uses this user for internal communication with VOSS Automate.

- Create an administrator account on VOSS Automate, with a credential policy and password that doesn't expire.
- Log in as a utility admin and add an NBI user with the following minimum permissions:
  - relation/HcsHierarchyNodeREL
    - read
  - relation/Subscriber
    - read
  - tool/Macro
    - execute (with read access on subscribers)

For VOSS Automate Provider administrators wishing to log in to the NBI GUI, the following permissions are required in the access profile:

- data/Reports
  - read
- tool/DataExtract
  - nbi_subscriber

2.4. Installation Procedure

2.4.1. Deploy the new install OVA

Note: Required resources for server with a Generic role are: 2 vCPUs and 4096 MB of RAM, and 80GB Database disk.

Install OVA, using the "Generic" type in VMware

The downloaded OVA file is imported into VMware vCenter Server. Only one OVA file is used to deploy all the functional roles.

You choose the *Generic* node *role* when the installation wizard is run.

1. Log in to vSphere to access the ESXi Host.
2. Choose **File > Deploy OVF Template**.
3. Choose Source, browse to the location of the .ova file, and click **Next**.
4. On the Name and Location page, enter a Name for this server.
5. On the Deployment Configuration page, select the Generic node type.
6. Choose the resource pool in which to locate the VM.
7. Choose the data store you want to use to deploy the new VM.
8. Choose the disk format to use when deploying the new VM.

   In production environments, "thick provisioning" is mandatory.

   Thick Provision Eager Zeroed is recommended.
9. On the Network Mapping, choose your network on which this VM will reside.
10. Do not select Power on after deployment.
11. On the Ready to Complete page, click **Finish** to start the deployment.
12. After the VM is created, select the CD ROM configuration and verify the **Connect at Power On** check box is enabled. Also, verify the memory, CPU, and disk settings against the requirements shown in either the Standalone System Hardware Specification or Multinode Cluster Hardware Specification section in the Install Guide.
13. Power on the VM.
14. Configure the options in the installation wizard.

Option	Option name	Description
1	IP	The IP address of the server.
2	netmask	The network mask for the server.
3	gateway	The IP address of the network gateway.
4	DNS	The DNS server is optional. Ensure that the DNS server is capable of looking up all hostnames referred to, including NTP server and remote backup locations.
5	NTP	The NTP server is mandatory to ensure that time keeping is accurate and synchronized among nodes in the same cluster.
6	boot password	Enable boot loader configuration password. See the example below.
7	hostname	The hostname, not the fully qualified domain name (FQDN).
8	role	A Generic role used for NBI nodes.
9	data center	The system's geographic location (data center name, city, country that a customer can use to identify the system location). You cannot change this setting once set.
10	platform password	Platform password must be at least eight characters long and must contain both uppercase and lowercase letters and at least one numeric or special character.

15. Boot up the Virtual Machine (VM)

2.4.2. Install and Configure the NBI Application

NBI Script Upload

Upload the NBI Install Script (`NBI-<name>-<version>.script`) to the media directory of the newly deployed VM.

Checksum Verification

To verify SHA256 checksums for the script, run the following command:

- `system checksum media/NBI-<name>-<version>.script`

NBI Package Install

Important: Ensure no ISO's are mounted prior to continuing (run **system unmount**).

1. `system unmount`
2. `app install media/NBI-<name>-<version>.script delete-on-success y --force`

NBI Configuration

If certificate-based authentication is used against the northbound system:

- Ensure the certificate file and key file is copied to the media directory before running the wizard.

Run the following command to configure the NBI using the wizard:

```
billing-data-extract config --setup
```

Option	Description	Example
remote_mongostring	Comma separated host:port combinations for VOSS Automate DB nodes.	<UN1 IP>:27020,<UN2 IP>:27020,<UN3 IP>:27020,<UN4 IP>:27020
remote_seed	The VOSS Automate DB password.	<secret value>
host	The IP address of this NBI node.	<NBI IP>
notifier_ca	The path to the CA certificate that is used to sign the NBI system's authentication certificate.	media/ca.pem
notifier_key	The path to the private key for NBI certificate-based authentication.	media/key.pem
notifier_cert	The path to the certificate for NBI certificate-based authentication.	media/cert.crt
notifier_useCerts	Configuration to determine if certificate-based authentication is required by the northbound system.	True or False
notifier_url	The HTTP API URL exposed by the northbound system for receiving notifications from NBI.	https://<host>:<port>/<endpoint>
callback_username	NBI callback service username used by the northbound system.	<username>
callback_password	NBI callback service password used by the northbound system.	<secret value>
secure_callback	Configuration to enable HTTPS on the callback service endpo	**True** if callback must accept requests over HTTPS otherwise **False**
http_connection	IP address of VOSS Automate API, web proxy recommended for redundancy.	<WP IP>
http_user	VOSS Automate username for NBI's API user.	<VOSS Automate API username for NBI>
http_pass	VOSS Automate password for NBI's API user.	<VOSS Automate API password for NBI>
http_user	VOSS Automate username for NBI's API user.	<VOSS Automate API username for NBI>
schema	The 2 or 3 abbreviation allocated to you by VOSS.	XY or ABC

Configure Callback Service URL

Update the callback server URL as follows:

- Set the URL

```
billing-data-extract config --set callback.url https://<NBI IP>:5009/callback
```

Important: The callback service URL must either be HTTP or HTTPS depending on the value set for `secure_callback`

- Restart services to apply the configuration change:

```
app start --force
```

Configure NBI SDE (Reconciliation) File Extraction

1. On the NBI server:
   - Login as root

     ```
     app install nrs --force
     ```
   - Check if ssh key pair exists

     ```
     ls /root/.ssh/id_rsa
     ```
   - Generate ssh key pair if it does not exist

     ```
     ssh-keygen
     ```
   - Copy public key to the VOSS Automate node where SDE runs nightly

     ```
     scp /root/.ssh/id_rsa.pub platform@<VOSS Automate IP>:~/media/
     ```
2. On the VOSS Automate node where SDE runs nightly:
   - Login as platform user
   - Add SFTP-only user

     ```
     user sftp add nbi_sftp
     ```
   - Set password for SFTP-only user

     ```
     user sftp password nbi_sftp
     ```
   - Disable password expiry for SFTP-only user

     ```
     user password expiry nbi_sftp never
     ```
   - Add the key from the media directory

     ```
     user addkey nbi_sftp ~platform/media/id_rsa.pub
     ```
   - Ensure that SDE has been run for the current day. If not, run it manually

     ```
     voss export group subscriber
     ```
3. On the NBI server (as root):
   - Verify that SFTP is using both key- and password-based authentication

     ```
     sftp -vv nbi_sftp@<VOSS Automate IP>
     ```

- Create the NBI SDE output directory

  ```
  mkdir -p /opt/platform/admin/home/media/nbi_extract
  ```

- Change ownership of the NBI SDE output directory

  ```
  chown platform /opt/platform/admin/home/media/nbi_extract
  ```

- Edit the config to set up SFTP access details

  ```
  crypttools.py edit /opt/platform/apps/billing-data-extract/billing-data-extract.json
  ```

Key	Description	Example
sde.v4uc_ip	The IP address of the VOSS Automate node where SDE runs daily.	<UN1 IP>
sde.nbi_sftp_user	SFTP username in VOSS Automate	nbi_sftp
sde.nbi_sftp_password	The SFTP user's password in VOSS Automate	<secret>
sde.src_location	The path where SDE files are saved in VOSS Automate	media/data_export

- Test NBI SDE and verify that output is generated and saved in the correct location

  ```
  billing-data-extract run_sde
  ```

2.5. Post-Checks

2.5.1. NBI Checks

In the NBI CLI:

- View billing data extract config

  ```
  billing-data-extract config --view
  ```

- Confirm all services are running

  ```
  app status
  ```

- Test connection to VOSS Automate API and database

  ```
  billing-data-extract test_connection
  ```

In the NBI GUI:

- Spot check activation states (site and subscribers)
- Verify messages that predate the server deployment are visible in message tracking

2.5.2. End-to-End Test

In the VOSS Automate GUI:

- Create a new test subscriber. Confirm message appears in NBI
- Make a change to an existing test subscriber. Confirm message appears in NBI