

How to Deploy a Virtual Test Agent Image in Google Cloud

Published

2021-01-13

Table of Contents

Executive Summary

Paragon Active Assurance: Solution Overview

Prerequisites

Uploading and Deploying a vTA Image Through the Google Cloud Web GUI

Troubleshooting

Using the Interactive Serial Console

Appendix: Description of the vTA VNF and Its Requirements

Executive Summary

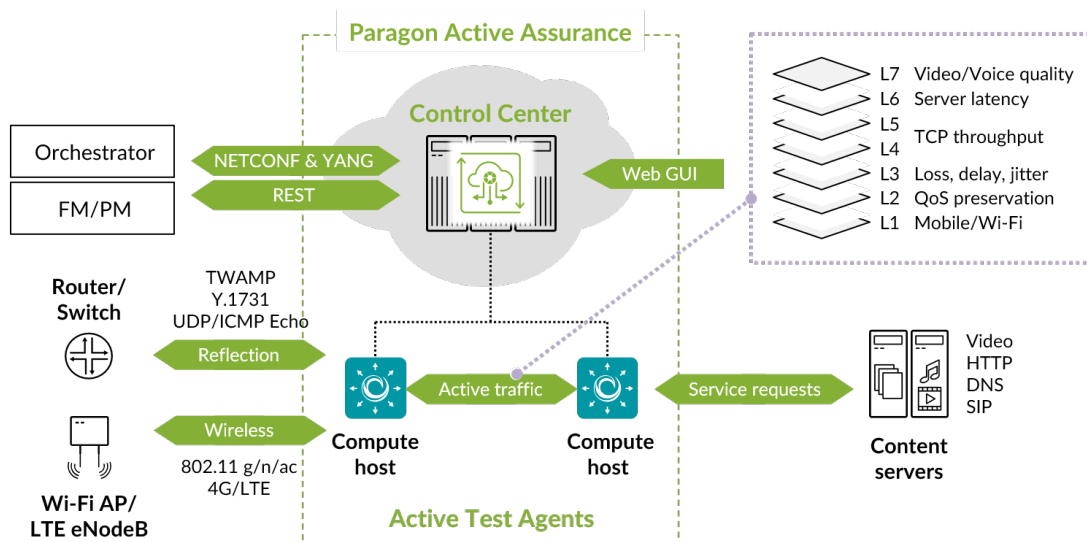
This guide explains how to deploy a Virtual Test Agent from Paragon Active Assurance as a virtual machine in Google Cloud.

Paragon Active Assurance: Solution Overview

Paragon Active Assurance consists of two parts:

1. **Test Agents** – software-based active traffic generators. Virtual Test Agents (vTAs) are ones that you upload and boot from your own OpenStack environment. These vTAs will automatically connect to Control Center as part of the deployment process described in this guide. (Juniper Networks also offers non-virtual Test Agents in the form of software that is installed on stand-alone x86 hardware.)
2. **Control Center** – for centralized control and coordination of Test Agents, including distributed VNF vTAs. This includes initiating test sequences and monitoring sessions, as well as evaluating collected measurement data, SLAs and KPIs.

Paragon Active Assurance vTAs are controlled through Control Center. The interface towards Control Center is either a web GUI or an orchestration API, as illustrated below:



Prerequisites

IN THIS SECTION

- [Control Center Account](#) | 2
- [vTA Image](#) | 2

Control Center Account

You need an account in a Control Center in order to access it: either the one belonging to the SaaS solution or one installed on-premise in your organization. If you do not already have a Paragon Active Assurance account, please contact your Juniper partner or your local Juniper account manager or sales representative.

vTA Image

The vTA image is provided either by one of Juniper's partners or directly by Juniper.

The vTA image for Google Cloud is available for download in Control Center. It has the file extension .gcp.tar.gz:



Test Agent Appliance

- Built as a complete Linux distribution
- Supports [multiple features](#)
- Read [installation instructions](#)

Download

- [RAW disk image \(.img.gz\)](#)
- [QEMU v2 disk image \(.qcow2\)](#)
- [Open Virtual Appliance Package \(.ova\)](#)
- [Google Cloud image \(.gcp.tar.gz\)](#)
- [Azure image \(.vhd\)](#)

Once you have your vTA image, you need to upload it to your Google Cloud environment and deploy it.

Uploading and Deploying a vTA Image Through the Google Cloud Web GUI

IN THIS SECTION

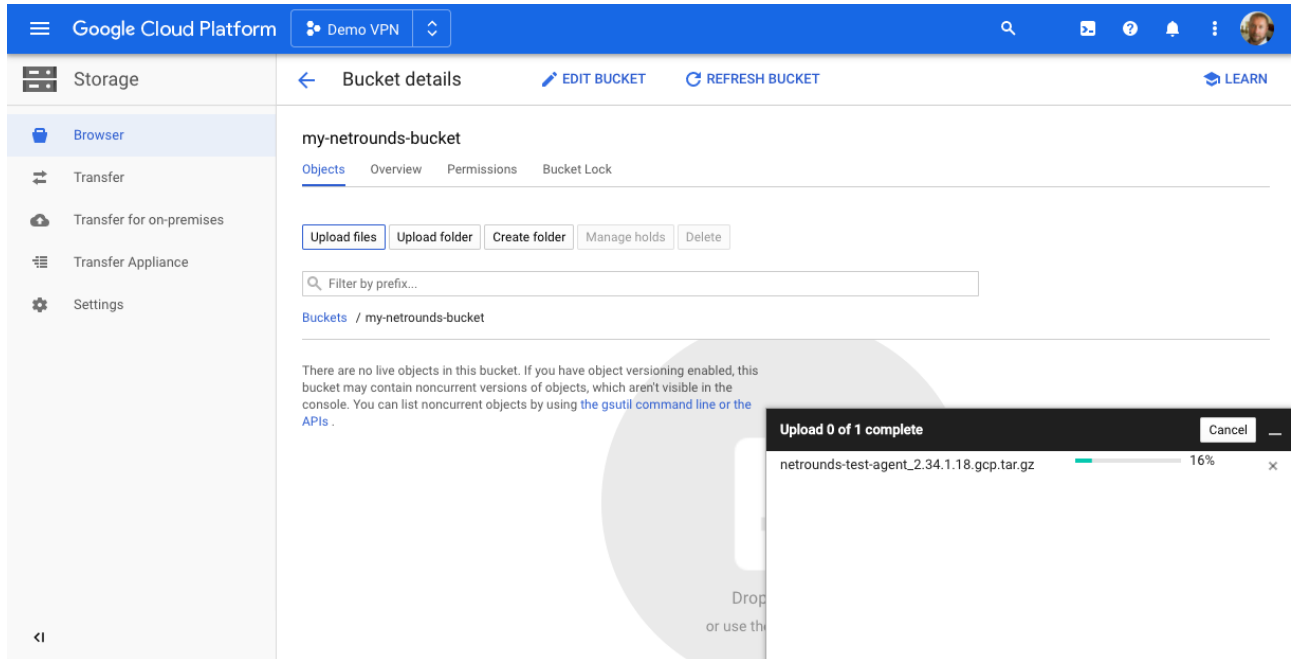
- Signing In to Google Cloud | 3
- Uploading a Test Agent Image to Google Cloud | 3
- Registering a Compute Image | 4
- Creating a VM Instance | 5

Signing In to Google Cloud

- Go to <https://cloud.google.com>.
- Sign in to your Google account if you are not signed in already.

Uploading a Test Agent Image to Google Cloud

- In your GCP console, create a storage bucket to host the Test Agent image file and then click **Upload files** to upload the image to this bucket.



Registering a Compute Image

- Register a new compute image by referring to the file in the cloud storage bucket (**Cloud Storage File** in the screenshot below). It will take a minute or two to create the image.

Google Cloud Platform

Demo VPN

Compute Engine

VM instances

Instance groups

Instance templates

Sole-tenant nodes

Machine images

Disks

Snapshots

Images

TPUs

Committed use discounts

Metadata

Health checks

Zones

Network endpoint groups

Operations

Security scans

OS patch management

Settings

Marketplace

Create an image

Name [?]

Name is permanent

my-netrounds-test-agent-2-34-1-18

Source [?]

Cloud Storage file

Cloud Storage file [?]

Your image source must use the .tar.gz extension and the file inside the archive must be named disk.raw. [Learn more](#)

☒ my-netrounds-bucket/netrounds-test-agent_2.34.1.18.gcp.tar.gz

Browse

Location [?]

☒ Multi-regional
☐ Regional

eu (European Union) (default)

Family (Optional) [?]

Description (Optional)

Labels [?] (Optional)

+ Add label

Encryption

Data is encrypted automatically. Select an encryption key management solution.

☒ Google-managed key
No configuration required
☐ Customer-managed key
Manage via Google Cloud Key Management Service
☐ Customer-supplied key
Manage outside of Google Cloud

You will be billed for this image. [Compute Engine pricing](#)

Create

Cancel

Equivalent REST or command line

Creating a VM Instance

- We can now launch compute instances based on this image:

☰

Google Cloud Platform

Demo VPN

⬆

🔍

Search resources and products

⬇

📧

❓

🔔

⋮

⚙️

Compute Engine

📄

 VM instances

👤

 Instance groups

📄

 Instance templates

👤

 Sole-tenant nodes

📄

 Machine images

💾

 Disks

📷

 Snapshots

🔍

Images

Images

➕

 CREATE IMAGE

🔄

 REFRESH

➕

 CREATE INSTANCE

🗑

 DEPRECATE

🗑

SHOW INFO PANEL

📖

 LEARN

Images

Image import history

Image export history

☰

my-netrounds

✕

Filter images

?

Columns

▼

<input checked="" type="checkbox"/>	Name	Location	Size	Disk size	Created by	Family	Creation time
<input checked="" type="checkbox"/>	my-netrounds-test-agent-2-34-1-18	eu	180.2 MB	2 GB	data-shard-220907		Apr 17, 2020, 3:20:14 PM

Show deprecated images

The default **Machine type** is set to “n1-standard-1”, which works well with the Test Agent, but both smaller and larger instances are supported as well. All machine types available today should work fine with the Test Agent.

Create an instance

To create a VM instance, select one of the options:

- New VM instance**
Create a single VM instance from scratch
- New VM instance from template**
Create a single VM instance from an existing template
- New VM instance from machine image**
Create a single VM instance from an existing machine image
- Marketplace**
Deploy a ready-to-go solution onto a VM instance

Name ⓘ
Name is permanent
my-netrounds-testagent

Labels ⓘ (Optional)
+ Add label

Region ⓘ
Region is permanent
europe-north1 (Finland)

Zone ⓘ
Zone is permanent
europe-north1-a

Machine configuration

Machine family
General-purpose | Memory-optimized
Machine types for common workloads, optimized for cost and flexibility

Series
N1
Powered by Intel Skylake CPU platform or one of its predecessors

Machine type
n1-standard-1 (1 vCPU, 3.75 GB memory)

Machine type details:

	vCPU	Memory
n1-standard-1	1	3.75 GB

\$26.81 monthly estimate
That's about \$0.037 hourly
Pay for what you use: No upfront costs and per second billing

Details

Container ⓘ
☐ Deploy a container image to this VM instance. [Learn more](#)

Under advanced settings it is possible to specify **Metadata**. This may be used to provide cloud-config to register the Test Agent with Control Center.

The user data should be provided as value to the key “user-data”:

Automation

Startup script ⓘ (Optional)
You can choose to specify a startup script that will run when your instance boots up or restarts. Startup scripts can be used to install software and updates, and to ensure that services are running within the virtual machine. [Learn more](#)

Metadata ⓘ (Optional)
You can set custom metadata for an instance or project outside of the server-defined metadata. This is useful for passing in arbitrary values to your project or instance that can be queried by your code on the instance. [Learn more](#)

user-data

```
#cloud-config
netrounds_test_agent:
  name: my-testagent
  email: myemail@example.com
  password: my-password
  account: my_account
  server: login.netrounds.com
```

+ Add item

Availability policy

Preemptibility
A preemptible VM is much less expensive than a standard VM, but it can be terminated at any time.

Once created and started, the instance will appear in the **VM instances** view:

Google Cloud Platform Demo VPN

Compute Engine VM instances

CREATE INSTANCE IMPORT VM

SHOW INFO PANEL LEARN

my-netrounds-testagent Filter VM instances

Name	Zone	Recommendation	In use by	Internal IP	External IP	Connect
my-netrounds-testagent	europe-north1-a			10.166.15.220 (nic0)	35.228.205.6	SSH

Related Actions

- View Billing Report**
View and manage your Compute Engine billing
- Monitor Stackdriver Logs**
View, search, analyze, and download VM instance logs
- Setup Firewall Rules**
Control traffic to and from a VM instance
- Manage Quotas**
View or request increases to your VM instance quotas

Dismiss

It should also appear in Control Center as a new Test Agent:

netrounds

Krogell_Demo jonas.krogell+admin@netrounds.com (Superadmin)

Test Agents

Interface info License info Download

Test Agents registered within the last 24 hours (only last 5 shown):
my-testagent

Test Agents

Clear Tags All Online Offline In use Free

Name	Description	Management IPv4	Management IPv6	Public IP	Applications	Share
my-testagent		10.166.15.220	-	35.228.205.6		

Page 1 of 1

Ready In use Offline Test Agent Appliance Test Agent Lite Test Agent Application

Test Agents shared with me

No Test Agents are currently shared with you.

Contacts | Feedback | Help | Site Map | Terms & Conditions | Privacy Statement | Cookie Policy v2.34.1

Troubleshooting

The instance serial log has details about boot-up and registration status:

The screenshot displays the Google Cloud Platform console interface. The top navigation bar includes the Google Cloud Platform logo, a 'Demo VPN' button, and a search bar. The left sidebar shows the 'Compute Engine' section with a list of resources: VM instances, Instance groups, Instance templates, Sole-tenant nodes, Machine images, Disks, Snapshots, Images, TPUs, Committed use discounts, and Metadata. The main content area is titled 'VM instance details' and shows the instance 'my-netrounds-testagent' with a green status icon. Below the instance name, there are tabs for 'Details' and 'Monitoring'. The 'Details' tab is active, showing sections for 'Remote access' (with SSH and 'Connect to serial console' options), 'Logs' (with links for 'Stackdriver Logging', 'Serial port 1 (console)', and 'More'), 'Instance Id' (5121463243787997511), 'Machine type' (n1-standard-1 (1 vCPU, 3.75 GB memory)), 'Reservation' (Automatically choose), and 'CPU platform' (Intel Skylake).

Google Cloud Platform Demo VPN Search resources and projects

Compute Engine VM instances

Instance groups

Instance templates

Sole-tenant nodes

Machine images

Disks

Snapshots

Images

TPUs

Committed use discounts

Metadata

VM instance details EDIT RESET CREATE MACHINE IMAGE

my-netrounds-testagent

Details Monitoring

Remote access

SSH Connect to serial console

Enable connecting to serial ports

Logs

Stackdriver Logging

Serial port 1 (console)

More

Instance Id

5121463243787997511

Machine type

n1-standard-1 (1 vCPU, 3.75 GB memory)

Reservation

Automatically choose

CPU platform

Intel Skylake

Google Cloud Platform

Demo VPN

Search resources and products

Compute Engine

Serial port 1

REFRESH

VM Instances

Instance groups

Instance templates

Sole-tenant nodes

Machine images

Disks

Snapshots

Images

TPUs

Committed use discounts

Metadata

Health checks

Zones

Network endpoint groups

Operations

Security scans

OS patch management

Settings

Marketplace

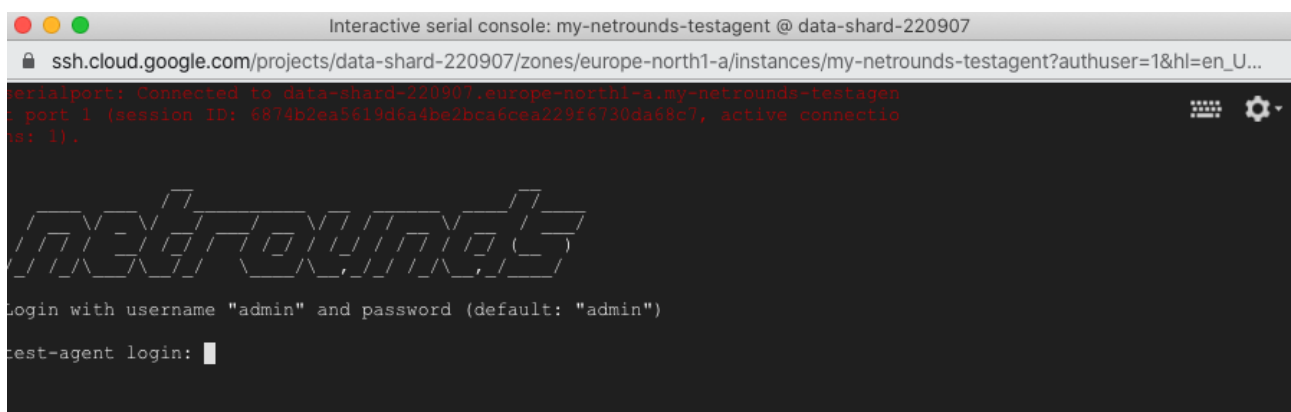
```

[ 0:32m OK [0m] Started [0:1:39m] Secure Shell server [0m.
[ 0:32m OK [0m] Started [0:1:39m] SSH server on management interface [0m.
netrounds-info: User data: Found key 'account' with value 'krogell_demo'
netrounds-info: User data: Found key 'email' with value 'admin@krogell.se'
netrounds-info: User data: Found key 'name' with value 'my-testagent'
netrounds-info: User data: Found key 'password'
netrounds-info: User data: Found key 'server' with value 'login.netrounds.com'
netrounds-info: Password config successful.
netrounds-info: Registration config found, server: login.netrounds.com:443, account: krogell_demo, email: admin@krogell.se
[ 0:32m OK [0m] Stopped [0:1:39m] OpenVPN connection to netrounds [0m.
Starting [0:1:39m] OpenVPN connection to netrounds [0m...
[ 0:32m OK [0m] Started [0:1:39m] OpenVPN connection to netrounds [0m.
netrounds-info: Management interface is eth0 with state {
  "available_speeds": [
    ],
    "auto":
  },
  "dns": [
    "169.254.169.254"
  ],
  "hw_ts_support": false,
  "ip": "10.166.15.228/32",
  "ip6": [],
  "link": true,
  "mac_hw": "42:01:8a:a6:8f:dc",
  "mtu": 1460,
  "pcid_device": 1,
  "pcid_vendor": 6900,
  "routes": {
    "0.0.0.0/0": "10.166.0.1"
  },
  "rx_bytes": 9715,
  "rx_packets": 58,
  "speed": null,
  "tx_bytes": 6287,
  "tx_packets": 64
}
netrounds-info: Registration successful.
[ 0:32m OK [0m] Started [0:1:39m] Apply the settings specified in cloud-config [0m.
Starting [0:1:39m] Execute cloud user/final scripts [0m...
ci-info: *****Authorized keys from /home/admin/.ssh/authorized_keys for user admin*****
ci-info: *****
ci-info: | Keytype | Fingerprint (md5) | Options | Comment |
ci-info: |-----|-----|-----|-----|
ci-info: | ssh-rsa | 64:98:e5:6a:62:5e:d2:62:d2:10:7b:3c:45:ea:07:79 | - | admin |
ci-info: *****
<14>Apr 17 13:31:51 ec2:
<14>Apr 17 13:31:51 ec2: *****
<14>Apr 17 13:31:51 ec2: -----BEGIN SSH HOST KEY FINGERPRINTS-----
<14>Apr 17 13:31:51 ec2: 1024 SHA256:v3RyhcqGCR0eAd7Wk4/Qv3M-Gd9Tsp175fka roottest-agent (DSA)
<14>Apr 17 13:31:51 ec2: 256 SHA256:zdMoZvGofq3je0RfuxF2yrBvRyrtfW5ir4qlyM roottest-agent (ECDSA)
<14>Apr 17 13:31:51 ec2: 256 SHA256:WvVyG3ccv3j/7fcXK53dPpXso/yWl0YmE174s roottest-agent (ED25519)
<14>Apr 17 13:31:51 ec2: 2048 SHA256:7iCtEqg7/Vq0vZ3Hq1Qd15qg.4Cv10P6EE3e0d4 roottest-agent (RSA)
<14>Apr 17 13:31:51 ec2: -----END SSH HOST KEY FINGERPRINTS-----
<14>Apr 17 13:31:51 ec2: *****
-----BEGIN SSH HOST KEY KEYS-----

```

Using the Interactive Serial Console

As an alternative to using cloud-config to register the Test Agent with Control Center, it is possible to enable the interactive serial console (as explained here: <https://cloud.google.com/compute/docs/instances/interacting-with-serial-console>) and then use the regular serial CLI to manage the Test Agent directly in your web browser.



Appendix: Description of the vTA VNF and Its Requirements

1. The vTA VNF is capable of running in a plain, “vanilla” environment using a standard cloud configuration and orchestration based on Google Cloud. There might be some limitations in terms of performance and also some minor limitations in terms of jitter and delay accuracy, depending on your Google Cloud infrastructure and how heavily loaded it is. However, for early proof-of-concepts and evaluations, this should not be a major issue. To obtain line rate packet generation and optimal usage of your specific hypervisor environment, an integration project would be required.
2. The vTA VNF consists of a single stand-alone VNF. However, the VNF must be able to connect and communicate securely with Paragon Active Assurance Control Center, which is not a VNF. Control Center is readily available in the public cloud (in addition to private cloud installations), something which simplifies test and evaluation projects.
3. Interfaces trust the natural OS bootstrap order in terms of how they are identified.
4. The performance is dependent on the underlying hardware. The more powerful the hardware, the higher the performance.
5. The minimum recommended specification is: 1 vCPU, 512 MB RAM, and 2 GB of block storage.
6. It is assumed that a generic VNF manager which is not part of the Paragon Active Assurance solution does the instantiation, scaling, and termination of the vTA VNF.
7. The vTA VNF needs to register with Control Center to receive commands. For public cloud Control Center scenarios, the VNF needs connectivity to the Internet from the eth0 interface. For plug-and-play configuration of the VNF, DHCP should be used for IP addressing of the vTA's interfaces, as well as for assignment of an available DNS server.
8. The VNF will resolve the Control Center address and initiate an outbound connection using TCP. (For details, see the Paragon Active Assurance support documentation.) To successfully connect and authenticate itself to the correct Paragon Active Assurance account, the VNF needs to have credentials provided to it during initialization. In the Google Cloud environment, these credentials can be entered as metadata for the VM instance (see the section ["Creating a VM Instance" on page 5](#)). Once the VNF has connected to Control Center, it can be controlled either via a web browser or through the Paragon Active Assurance cloud API to start monitoring user experience KPIs, conduct a service turn-up test, or perform on-demand troubleshooting tests. The connection is an encrypted OpenVPN connection.
9. The vTA VNF also requires synchronization to an NTP server in order to achieve accurate delay and jitter measurements. By default, Test Agents will synchronize their internal clock to time.google.com, a service provided by Google; however, any NTP server (internal or external) can be used.

10. Rescaling of the VNF again needs to be handled by a generic VNF manager (compare paragraph "6" on [page 10](#)). For example, if the available connection bandwidth is increased, the VNF might need to be scaled up to be able to push enough bandwidth through the link for testing purposes.