CONNECTING
THE WORLD

Containerised Niagara Explained

Jacqueline Walpole / Tridium
Paul Fahy / Tridium
Peter Shepherd / Forest Rock

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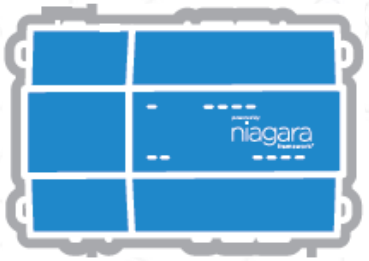
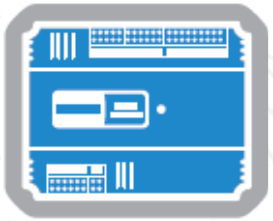
What is a Containerized Niagara?

hello

Niagara Deployment Platforms



IP & RS485



IP & 485 plus onboard IO

Supervisor

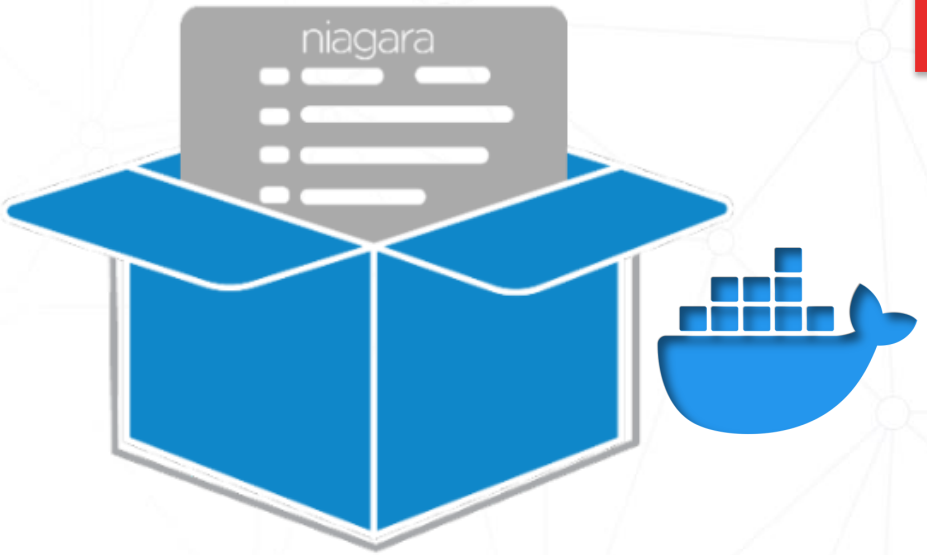
IP Integration Platform /Building Controller

Plant Room Controller

Small Plant/AHU/RTU Equipment Controller

VAV/Terminal Unit/Room Controller

Portability



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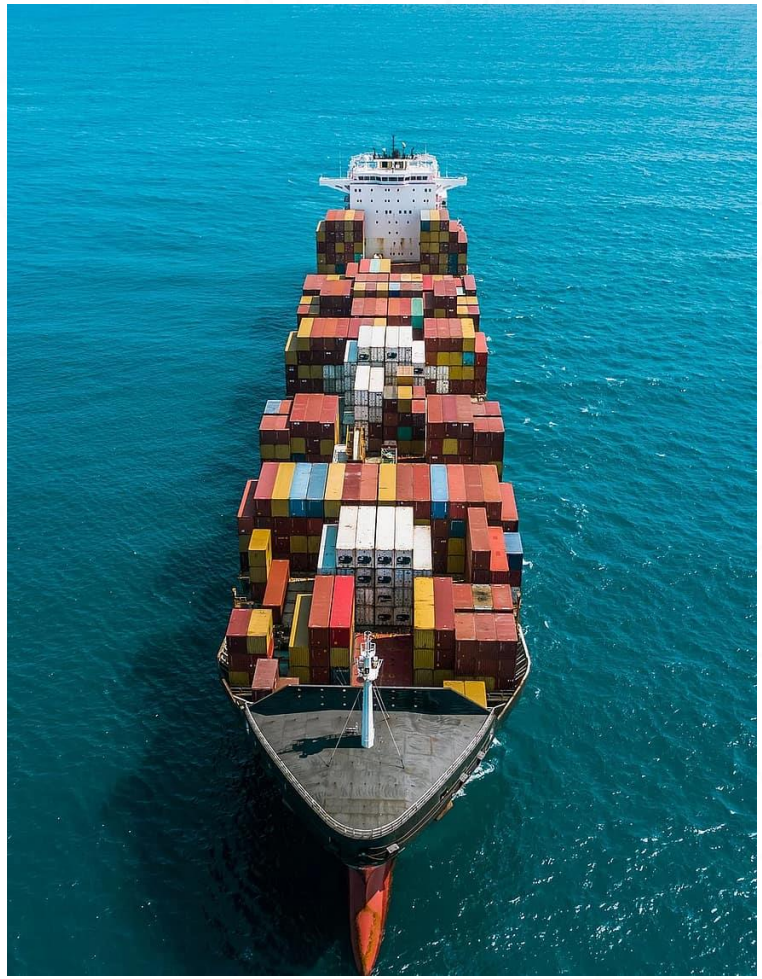
What is a container?



- Containers are technologies that allow the packaging and isolation of applications with their entire runtime environment and all of the files necessary to run.
- This makes it easy to move the contained application between environments (dev, test, production, etc.) while retaining full functionality.*

*Source redhat.com

Where can Containerized Niagara be utilised?

EMBEDDED HARDWARE

- For OEMs managing connected devices such as routers and hubs using a container management system, containers can facilitate **easy remote deployment** and **updating of Niagara**
- Portability alternative - embedded deployment whereby a Niagara development partner deploys Niagara containers on its own proprietary or a third-party commercial device

Connected Container Orchestration Platform

CONTAINERIZED PORTABLE NIAGARA (NCC-CPN)

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Where can Containerized Niagara be utilised?

CLOUD

- Supervisor deployment in a cloud service

ON PREMISE

- Supervisor deployment on a server device housed locally

CONTAINERIZED SUPERVISOR (NCC-SUP)

Benefits of a Container?

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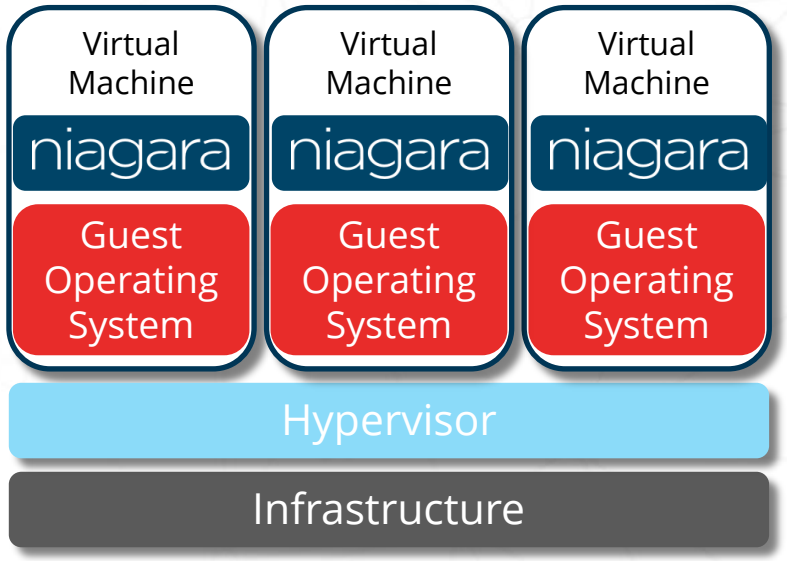
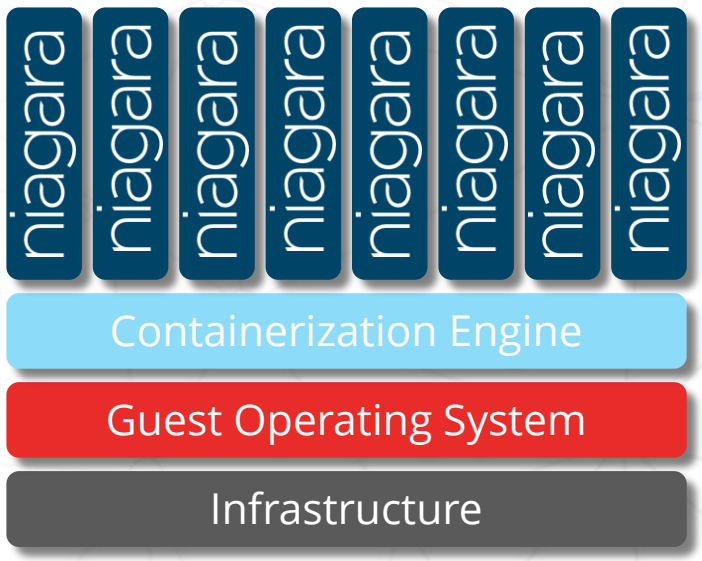
Benefits of containers over VMs?

Virtual Machines



Formerly Popular for Virtualization

Containers



Now Popular for Virtualization

Lightweight:

- Shares the host's OS system kernel
- Does not require an OS per application
- Driving higher server efficiencies
- Reduces server and licensing costs

Secure:

- Applications are safer in containers and provides the strongest default isolation capabilities in the industry

Containers are less resource intensive and more portable than Virtual Machines.
Can ease development, deployment and upgrades.

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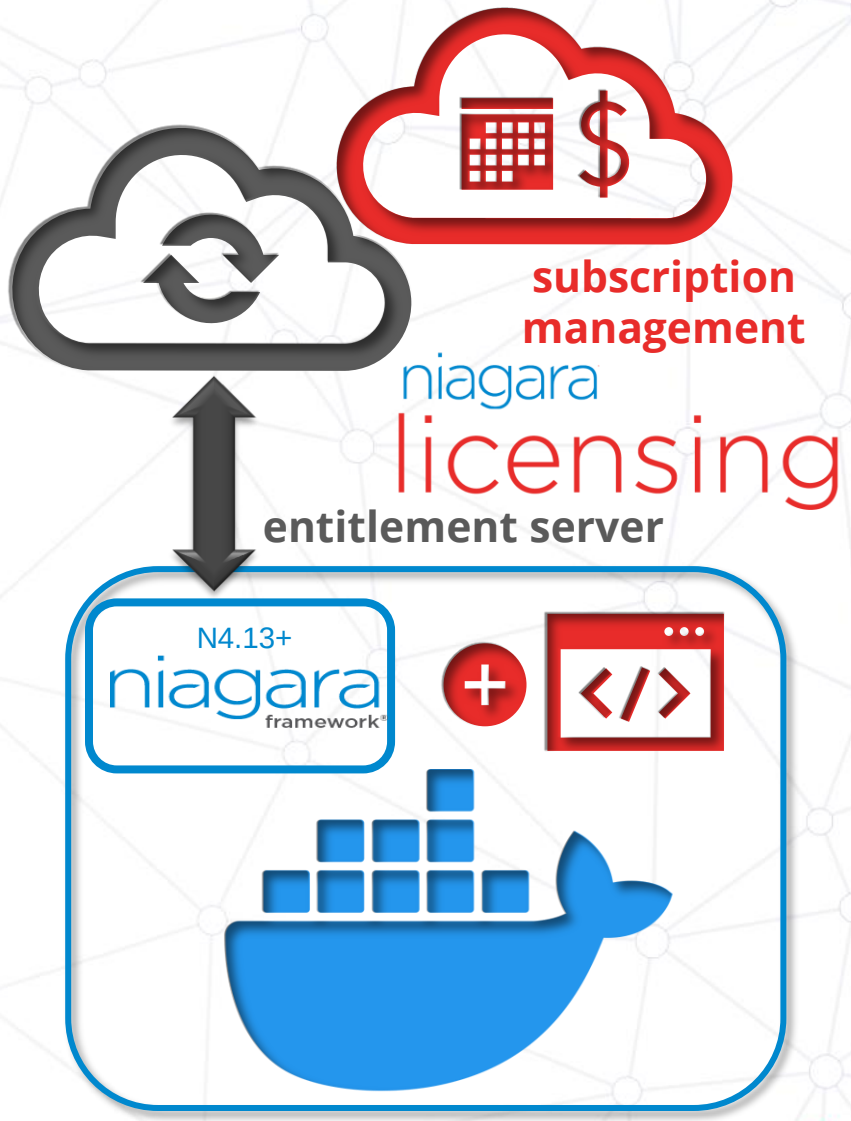
Containerised Niagara

- Niagara Framework supplied in a Docker™ container
- Support for AMD_x86 and Arm64 architecture
- Partner OEMs can add their own applications as required prior to the deployment of their container
- As the container is commissioned, it will contact the Tridium **Entitlement Server** to authorize install, deploy license, and stay activated
- Containerized Niagara was launched with N4.13 as a subscription only service



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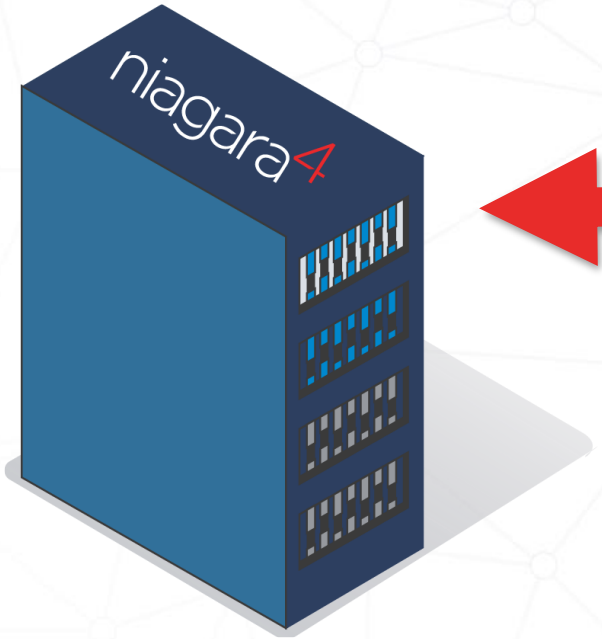
Subscription Licensing

SaaS Subscriptions:

- OPex rather than CAPex
- Less outlay - Less commitment
- SMA included in subscription

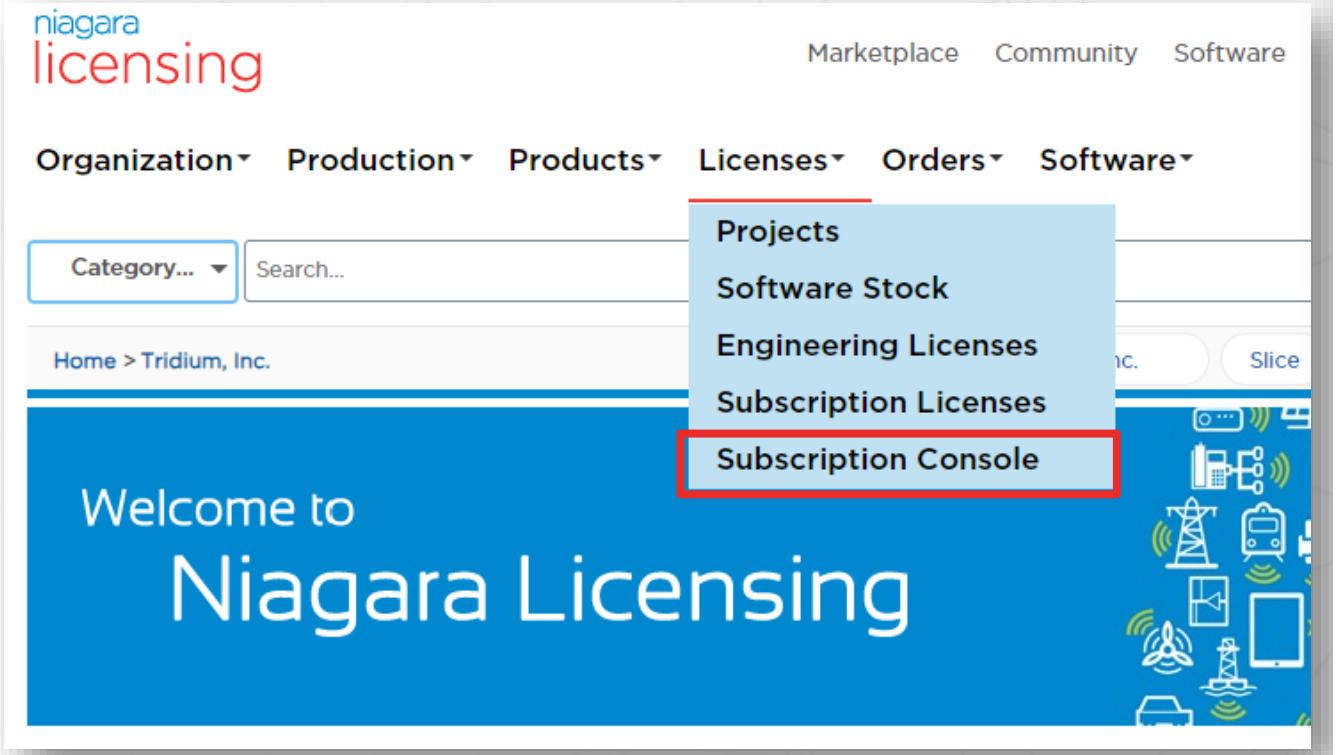


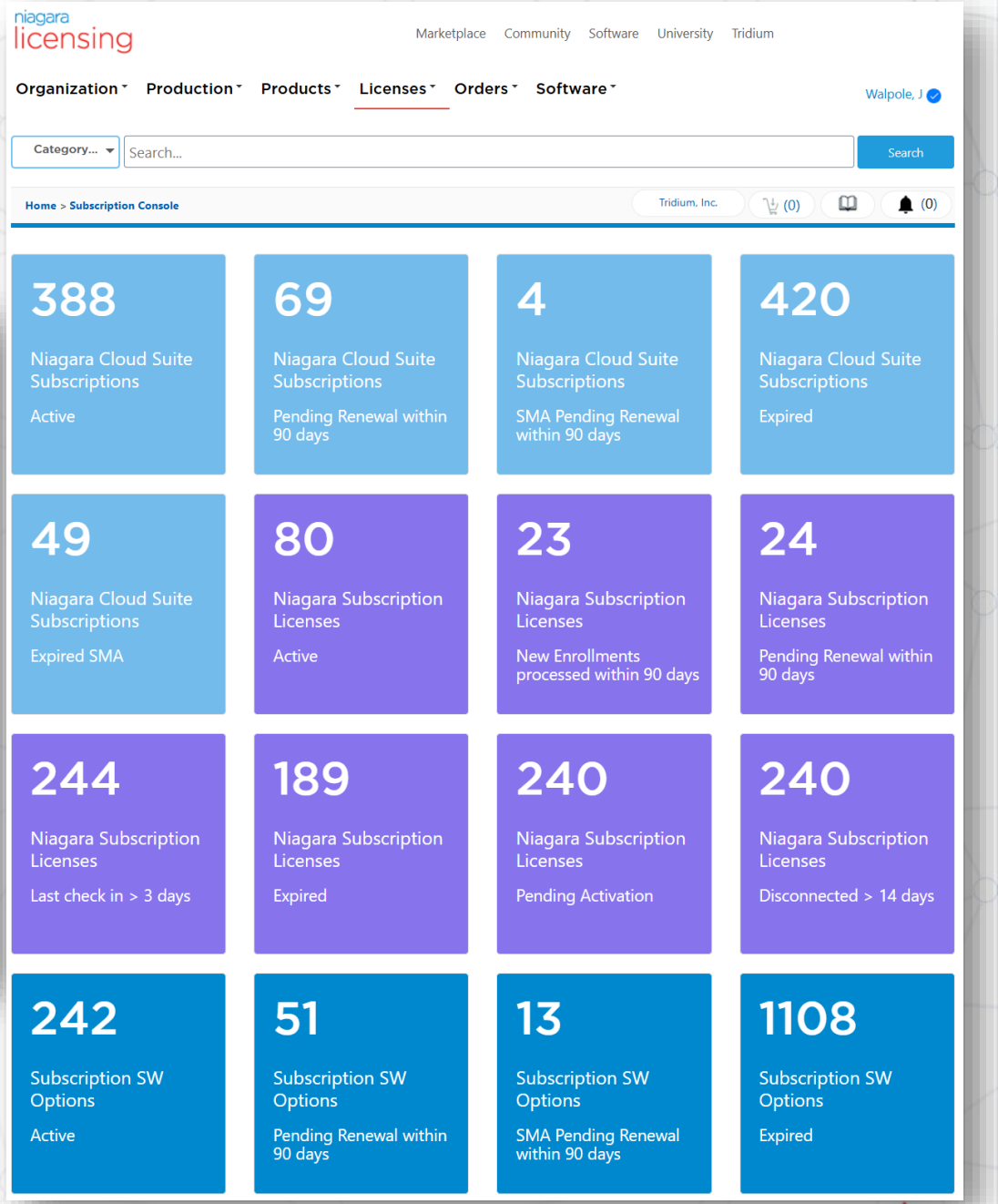
More purchasing flexibility!

niagara licensing

- NOTE: A subscription Niagara instance will perform a system exit—that is, it will stop working—if subscription renewal is not paid.

Subscription Licensing





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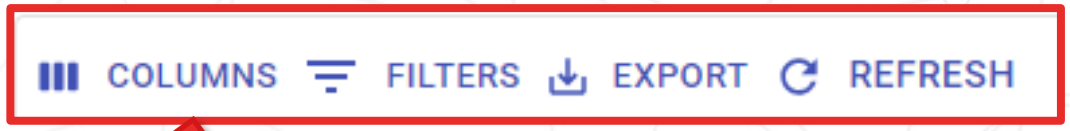
Subscription Licensing

Interactive tables allow selection of appropriate columns, filtering and exporting of data



Home > Subscription Console

Tridium, Inc. (0)

Niagara Subscription Licenses - Active

Niagara Subscription Licenses that are Active and Regularly Checking-In

COLUMNS 1 FILTERS EXPORT REFRESH

Host Code	Product	Expires	Last Check-In	Project	Subscriber	Project Owner
Nre-1C2D-A092-2B8D-4291-9656-7679-2EF6-3968	NTEST-NCC-SUP-100	14 Aug 2025	Wed Aug 14 2024 16:28:44 GMT+0100	TridiumInternalTestSUP	Tridium, Inc.	Tridium, Inc.
Nre-5EA5-535A-FE16-4E48-8849-31D0-31CA-877B	NTEST-NCC-SUP-100	23 May 2025	Thu Aug 03 2023 11:04:01 GMT+0100	TridiumInternalTestSUP	Tridium, Inc.	Tridium, Inc.
Nre-2F3C-2BCE-D4DC-47F9-ADE4-B640-CF74-7A45	NTEST-NCC-SUP-100	08 Aug 2025	Mon Mar 31 2025 05:53:53 GMT+0100	TRIDIUM UK TRAINING DEPARTMENT	Tridium, Inc.	Tridium, Inc.
Nre-2BE9-15B7-0A15-42A2-BAEC-68F2-281C-B18B	NTEST-J-CPN-0025	23 May 2025	Sun Mar 30 2025 22:51:53 GMT+0100	TridiumInternalTestCPN	Tridium, Inc.	Tridium, Inc.
Nre-8726-E09F-4F5A-4589-BD55-C874-872B-2E17	NTEST-J-CPN-0025	23 May 2025	No Check-In Detected	TridiumInternalTestCPN	Tridium, Inc.	Tridium, Inc.
Nre-E0FF-B67E-A806-4C88-9297-5CC1-6A35-9120	NTEST-NCC-SUP-100	05 Oct 2025	Mon Mar 31 2025 06:53:06 GMT+0100	TRIDIUM UK TRAINING DEPARTMENT	Tridium, Inc.	Tridium, Inc.
Nre-4CC8-5369-AF37-4968-9E66-C8[illegible]B-061D	NTEST-NCC-SUP-100	05 Oct 2025	Mon Mar 31 2025 00:05:39 GMT+0100	TRIDIUM UK TRAINING DEPARTMENT	Tridium, Inc.	Tridium, Inc.

Click through to view each license, Subscriber etc.

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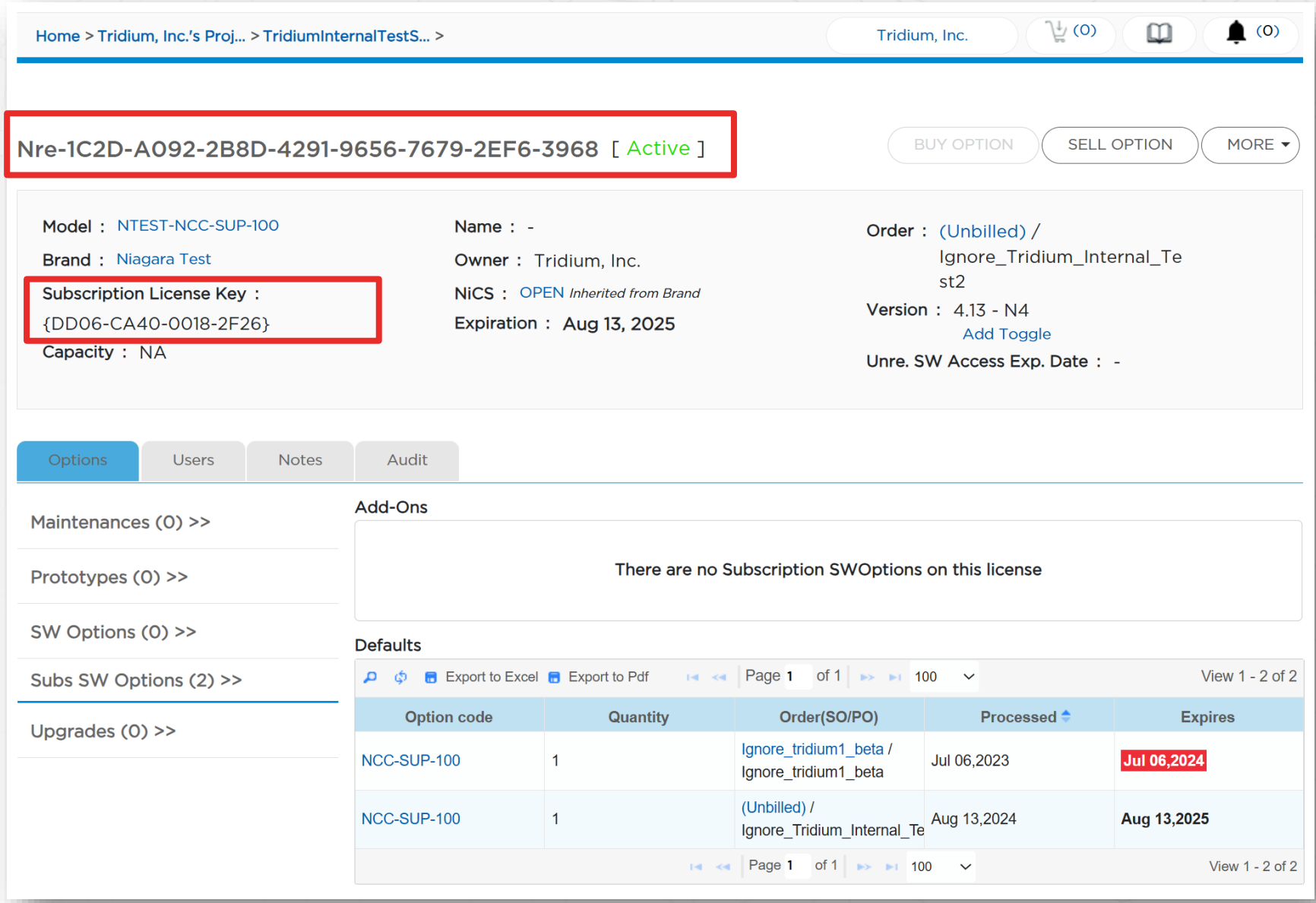
Subscription Licensing



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Containerised Niagara

Paul Fahy - Tridium

hello

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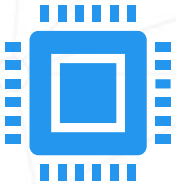
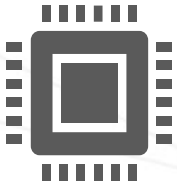
What about containerized Niagara?

Supported Architectures

- ARM favors simplicity and fast execution of single instructions.
- Uses less power and produces less heat.
- Ideal for embedded devices.



ARM
64



AMD
x86

- The x86 processors allow you to perform several activities at the same time from a single instruction.
- Used predominately in servers and PCs.

What about containerized Niagara?

- The File Domain Authentication (FDA) version is similar to how JACE is managed today
- Connect with Workbench client using default platform credentials
- Use the wizard to change the default platform credentials and passphrase similar to how a JACE is provisioned out of the box.
- Workbench client can be used to manage the passphrase and platform credentials using the platform administration view

Authorization Models

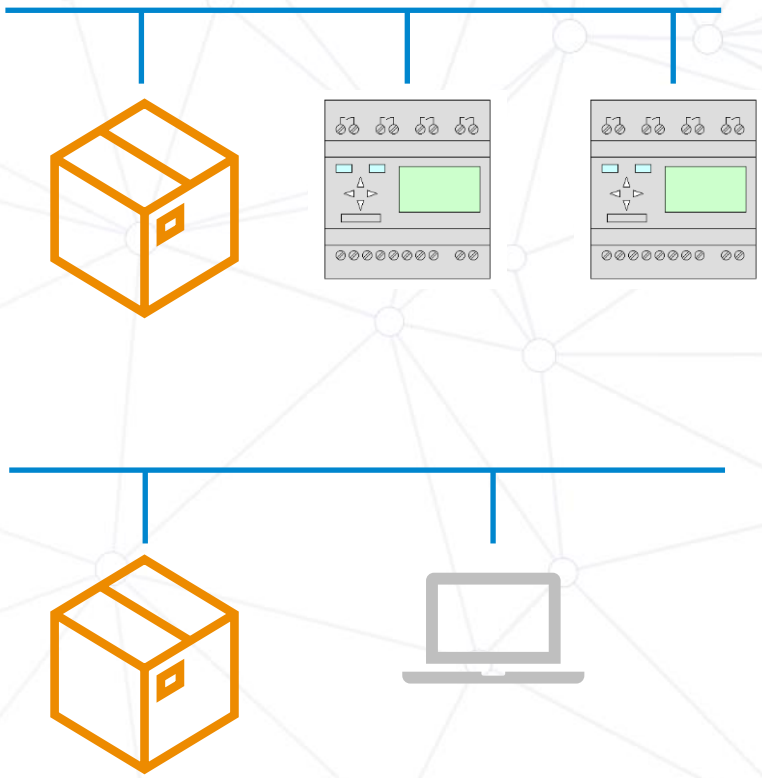
File Domain

Native Domain

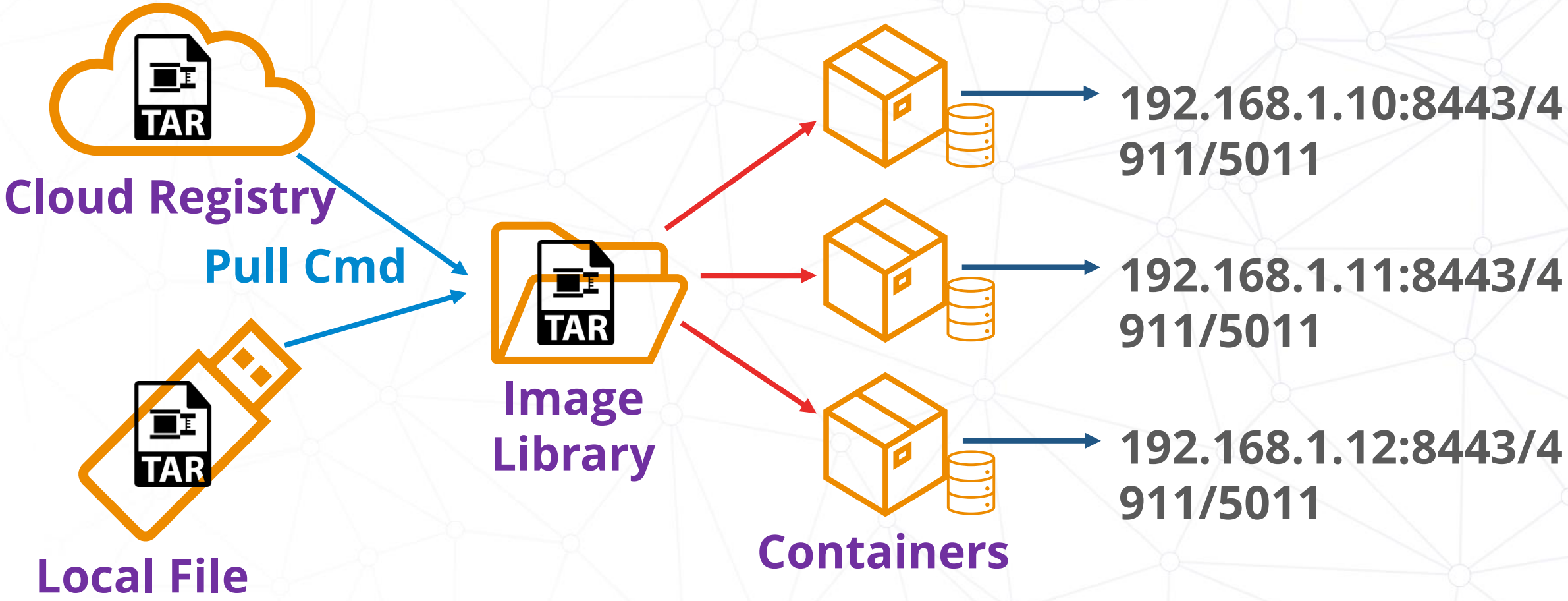
- The Native Domain Authentication (NDA) based version requires configuring the passphrase and platform credentials using either environment variables passed into the container runtime or using platform_password and system_passphrase files which are located under a volume which the container has access to
- This uses tools such as Kubernetes Secrets to manage all credentials
- Ideal for large scale deployments of Niagara

Worth noting

- Supervisor Container Models only support IP drivers
- Containers provide headless JAVA runtime
- Remote Workbench environment required to commission
- Browser support for station viewing and configuration



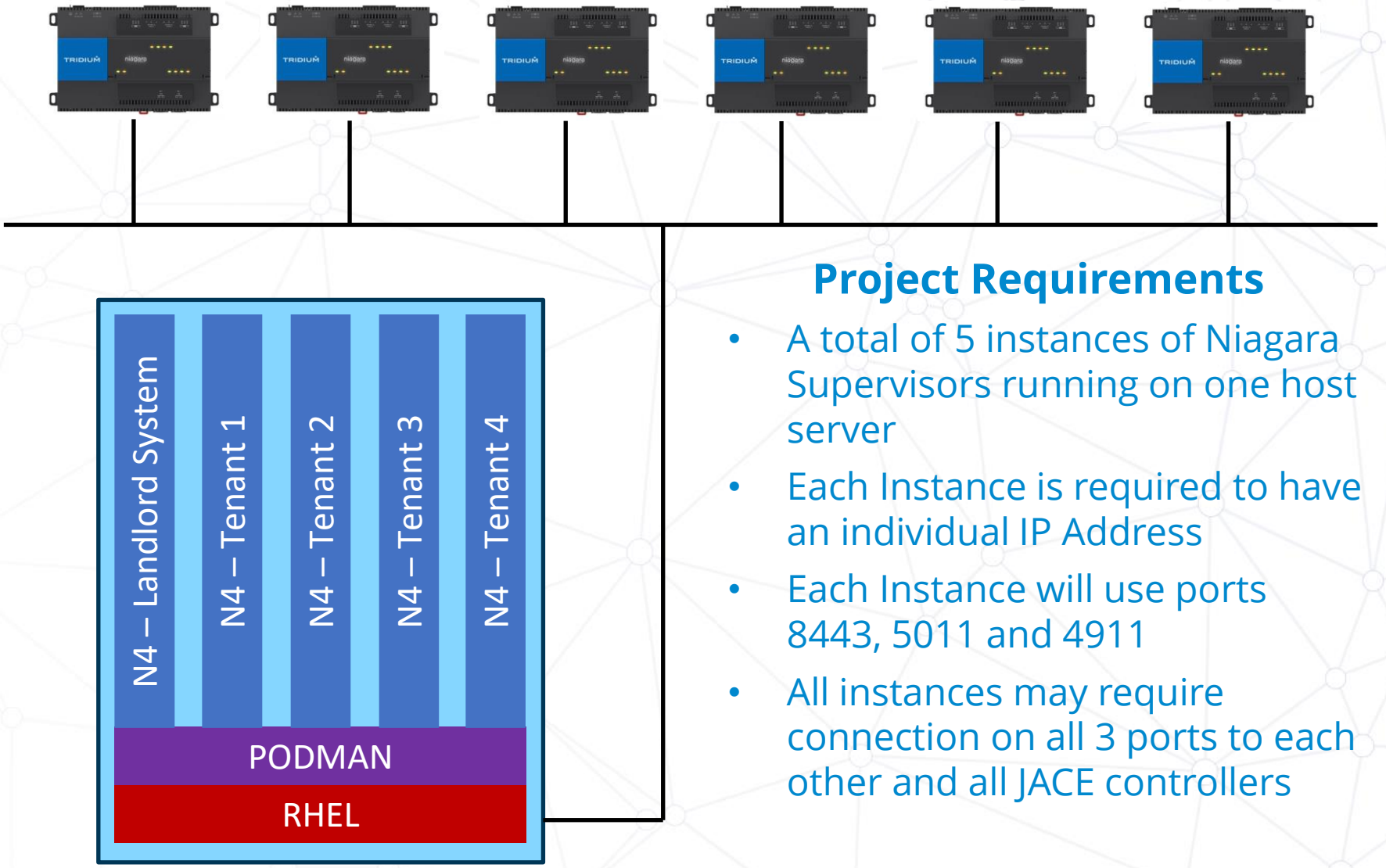
Container Workflow



Deployment Example

Multi-Tenant Building

hello



Project Requirements

- A total of 5 instances of Niagara Supervisors running on one host server
- Each Instance is required to have an individual IP Address
- Each Instance will use ports 8443, 5011 and 4911
- All instances may require connection on all 3 ports to each other and all JACE controllers

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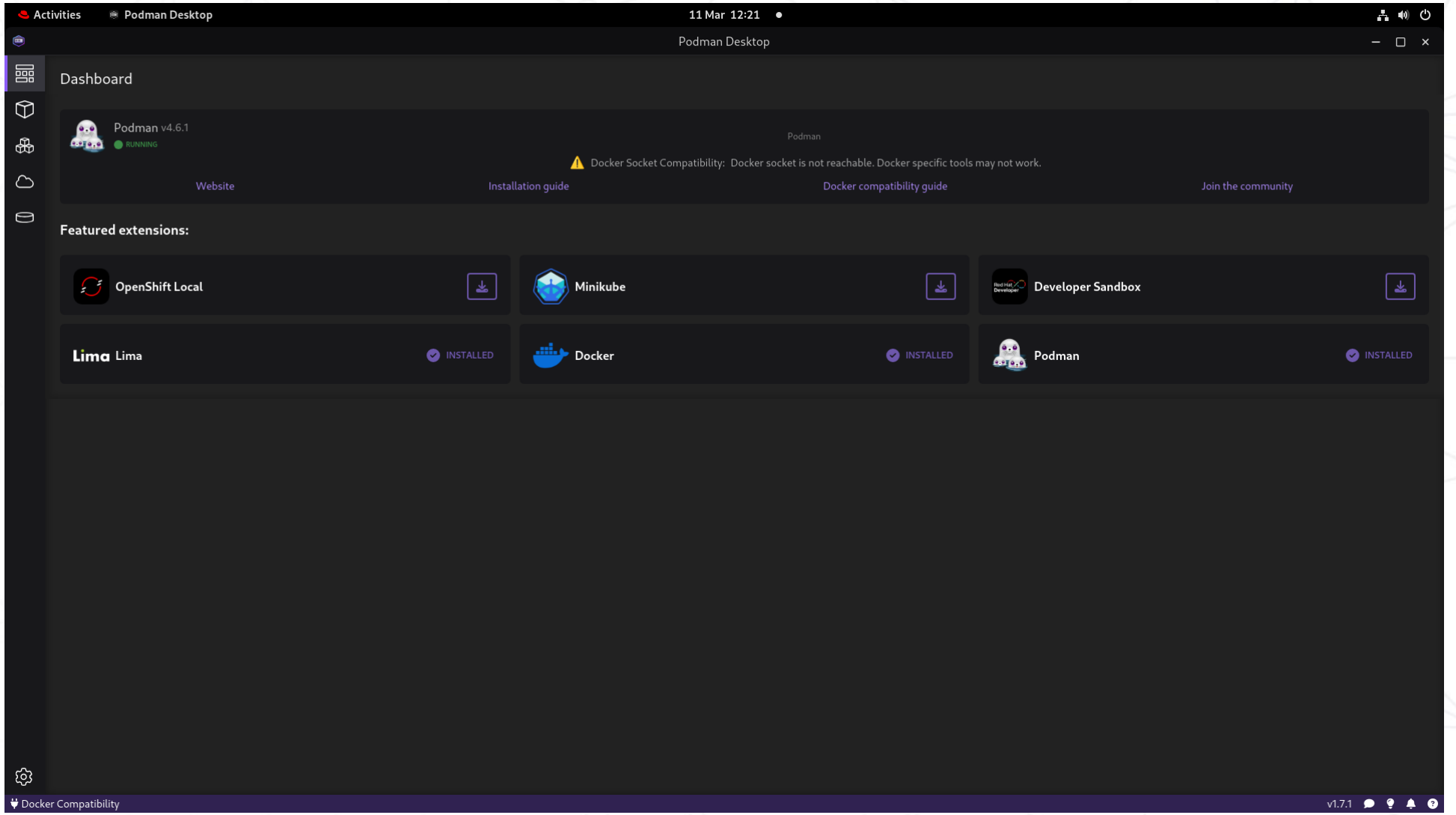
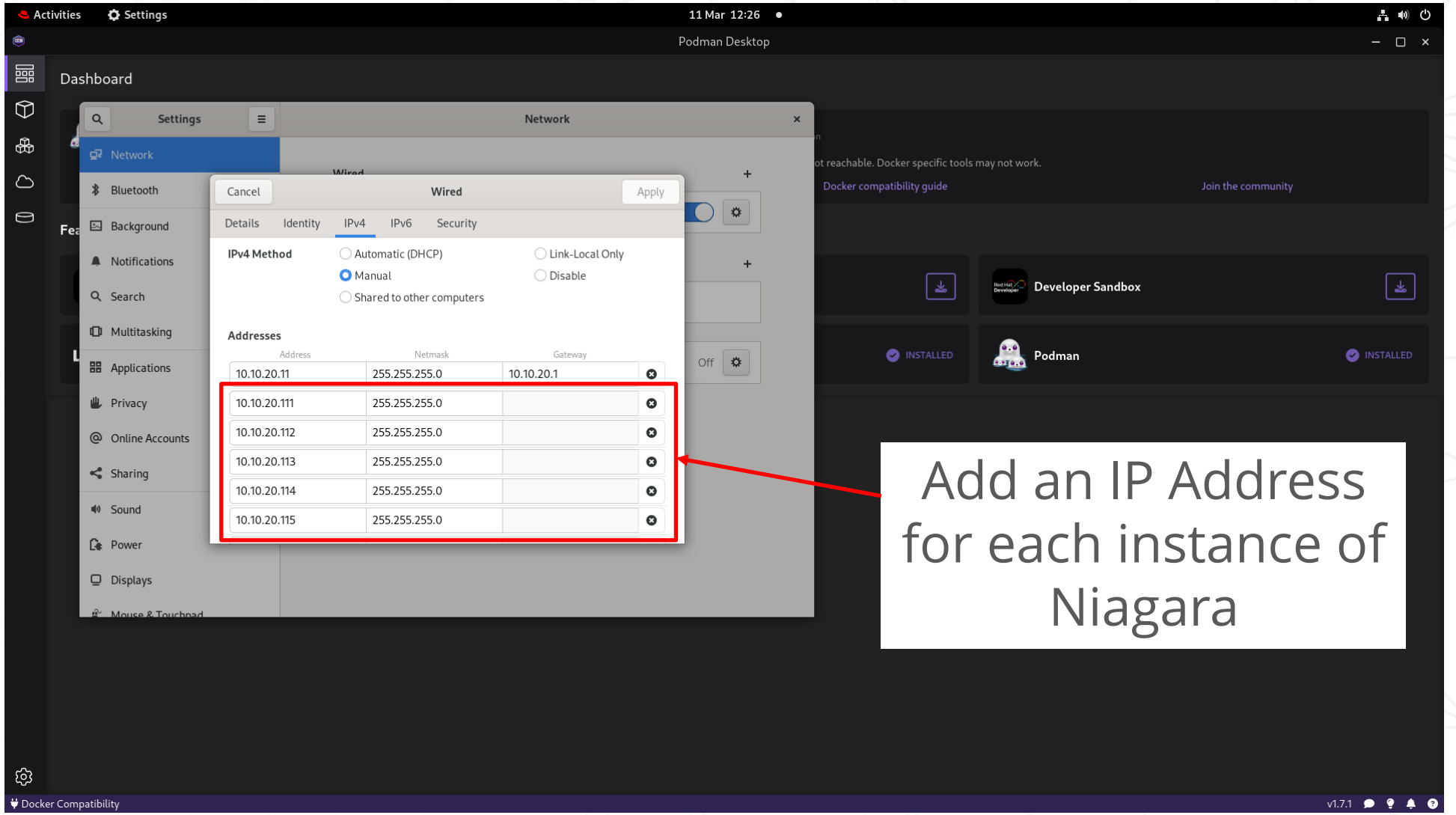

Activities
Podman Desktop
11 Mar 12:21
Podman Desktop
Dashboard
Podman v4.6.1
RUNNING
Podman
Docker Socket Compatibility: Docker socket is not reachable. Docker specific tools may not work.
Website
Installation guide
Docker compatibility guide
Join the community
Featured extensions:
OpenShift Local
Minikube
Developer Sandbox
Lima Lima
INSTALLED
Docker
INSTALLED
Podman
INSTALLED
Docker Compatibility
v1.7.1



Add an IP Address for each instance of Niagara

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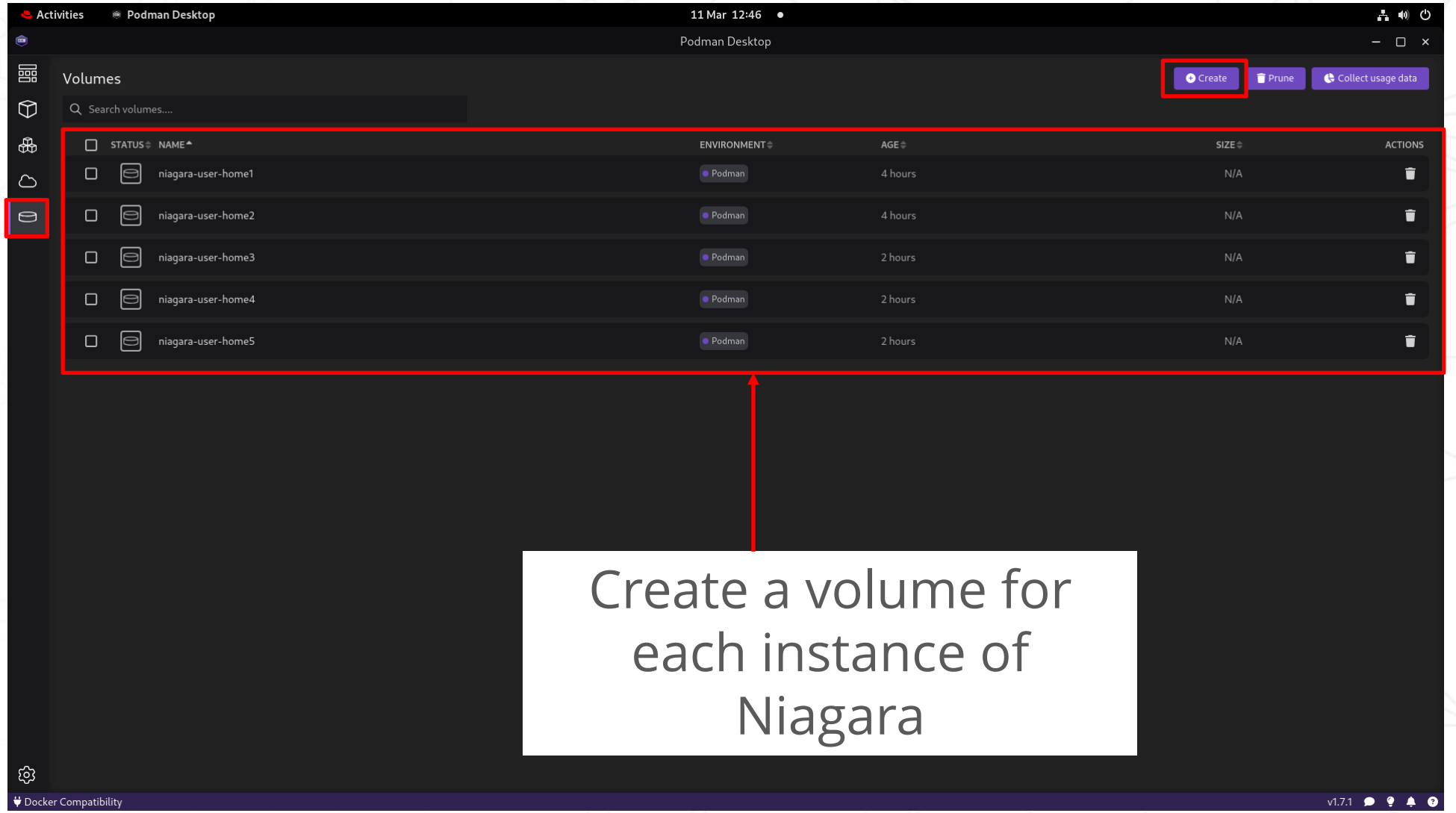
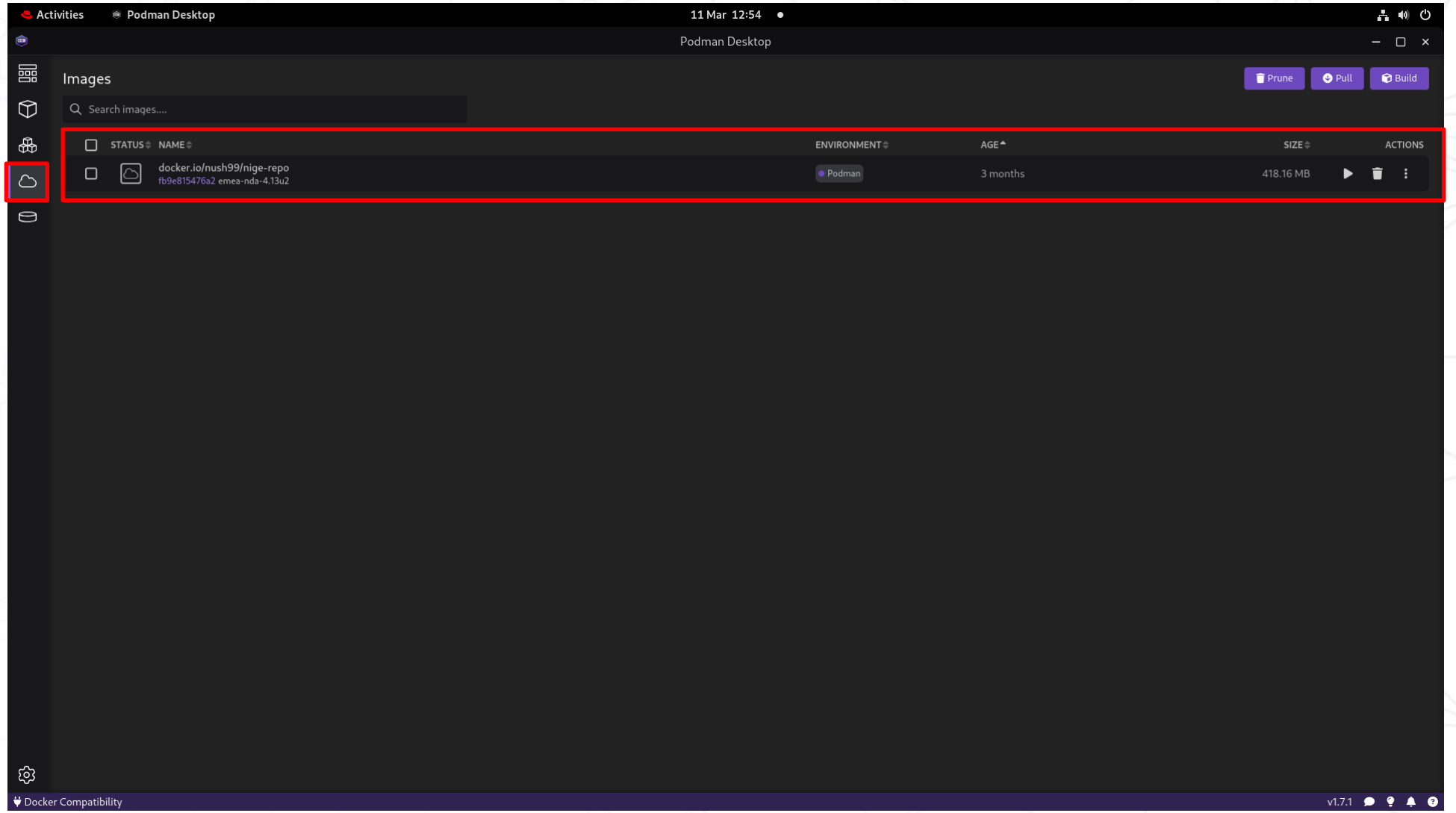


Create a volume for each instance of Niagara



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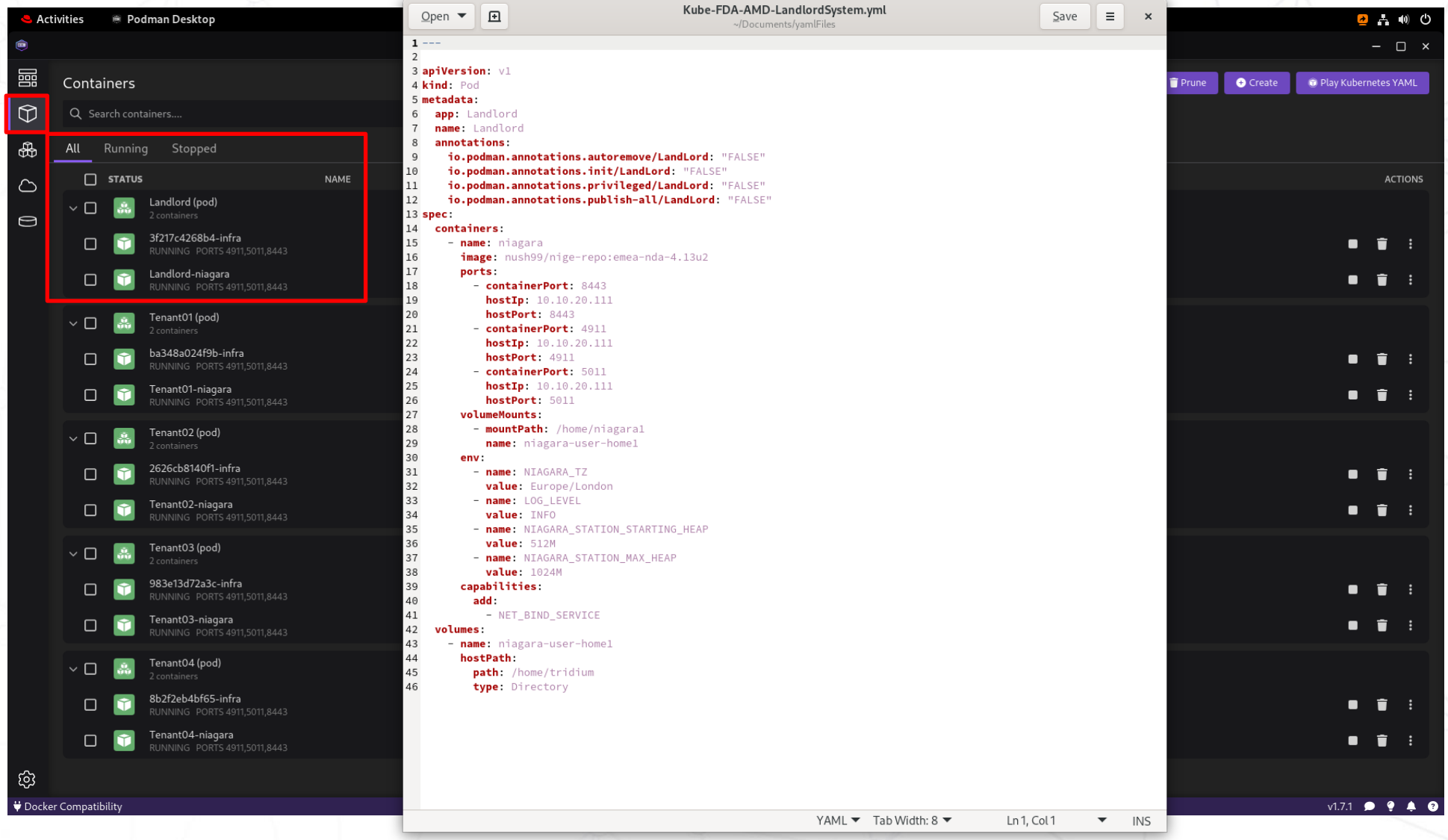

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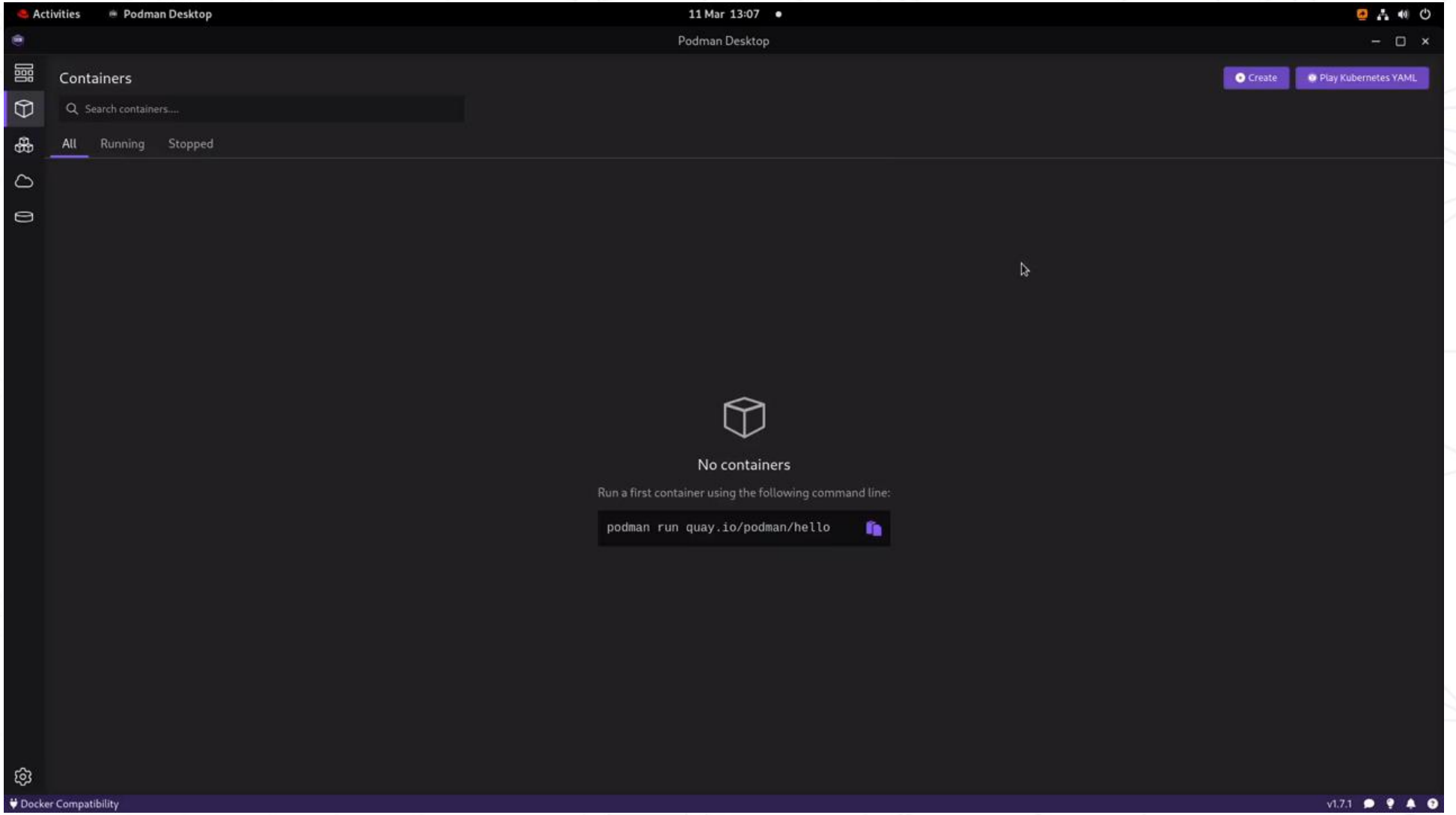
Activities
Podman Desktop
11 Mar 13:07
Podman Desktop
Containers
Create
Play Kubernetes YAML
Search containers...
All
Running
Stopped
No containers
Run a first container using the following command line:
podman run quay.io/podman/hello
Docker Compatibility
v1.7.1

Real World Experience

Peter Shepherd – Forest Rock

hello

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Forest Rock - Hosting Solutions

Forest Rocks' Hosting Journey

2019

Open Source

On Premise

High support

Malware risk

2020

Services

Project driven
Containerized services

2022

Scaling

VM scaling – horizontal / vertical

Standardization of configuration

2024

Increase speed
Reduce manual intervention

Dev Ops Integration

2025

Deployment

Multi-station hosting
Utilization efficiency

Time to Recovery

Pipeline driven deployment

Decouples recovery of containers and OS

Container

Terraform

Database and OS snapshots

Semi manual dev-ops

Hybrid

Recover server to office

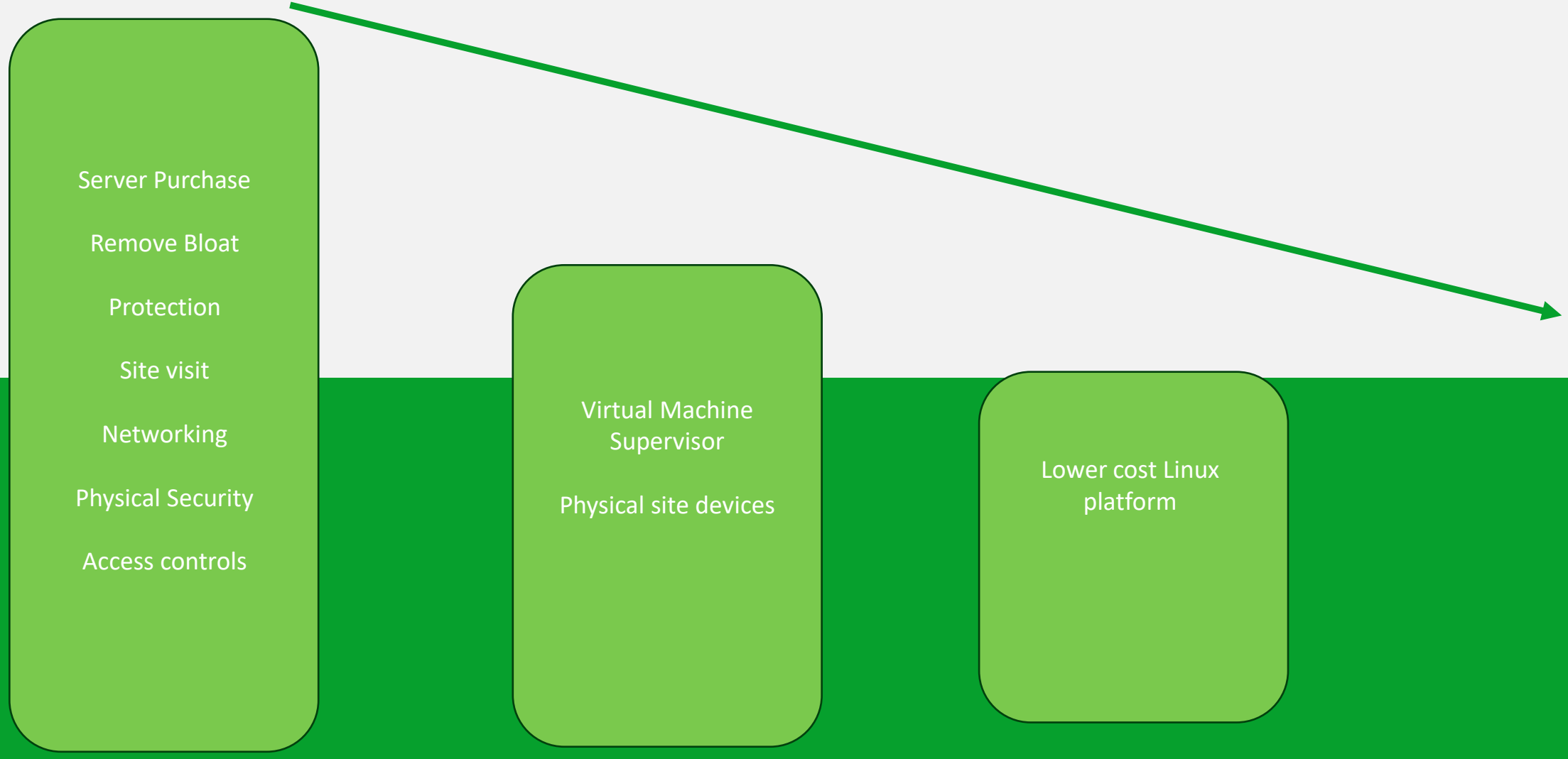
Site visits

Replacement parts

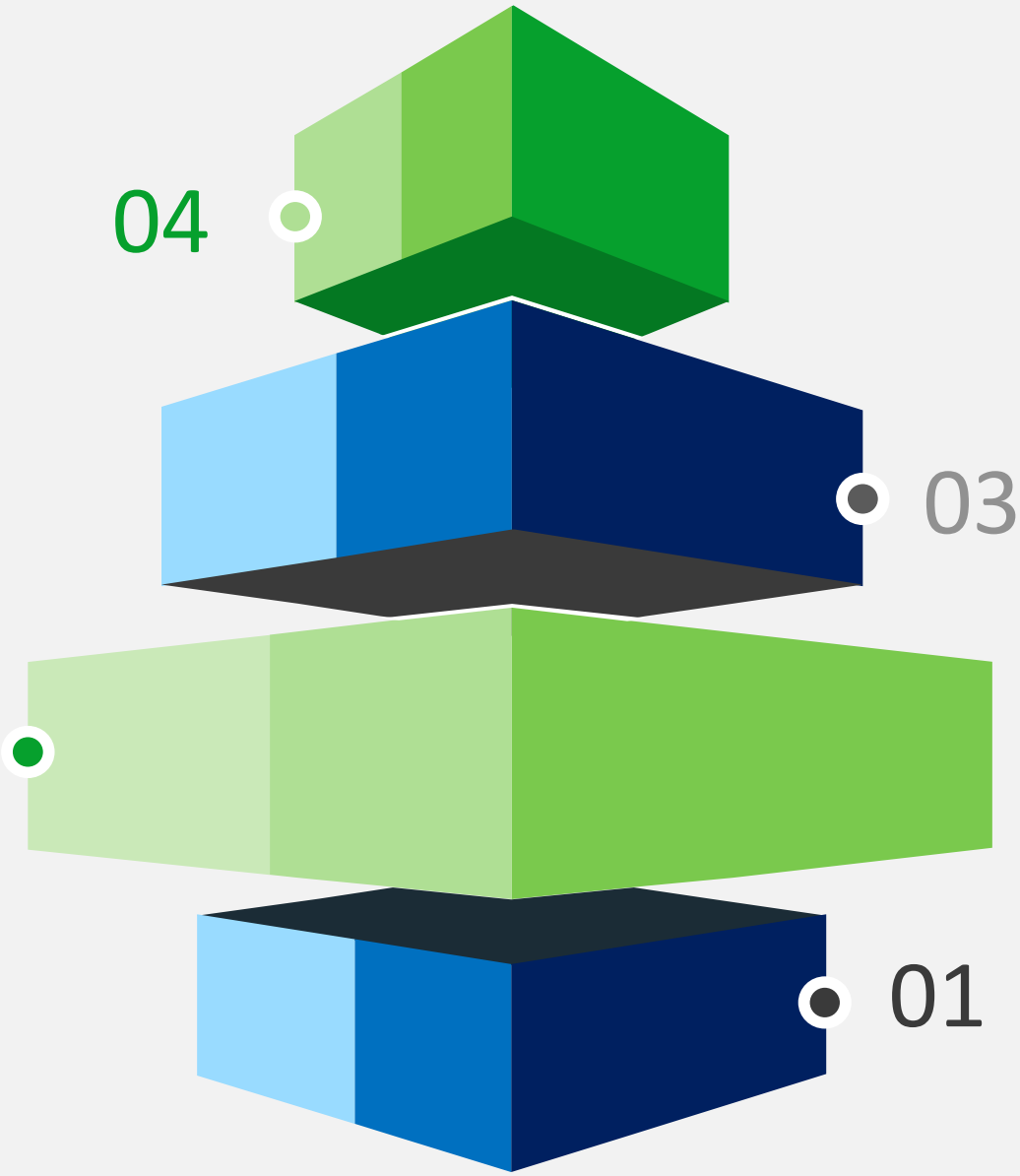
Backup strategy

On-Prem

Time To Delivery



A Layered Approach



04

Monitoring

Automated monitoring and alerting of container and host resources maintain capacity

03

Connectivity

Custom containers extend the Niagara environment to offer Zerotier connectivity automatically

02

Security

Best in class Bitdefender deployed to secure against malware threats

01

Host Platform

Linux virtual machines offer better use of resources with lower license overhead

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Customer Case Study

"We no longer have the expertise to effectively run our customer solutions, how can you help . . . ?"

Review

- Evaluate existing hosting capacity
- Understand solutions
- Recommend capacity

Planning

- Plan migration strategy
- Co-ordinate on licencing
- Provision containerised environment

Migration

- Migrate stations
- Migrate DNS
- Validate connections

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