RadZen DicomArk

DICOM Network Backup Device

Version 1.1

Installation Guide

www.futurezen.com.au

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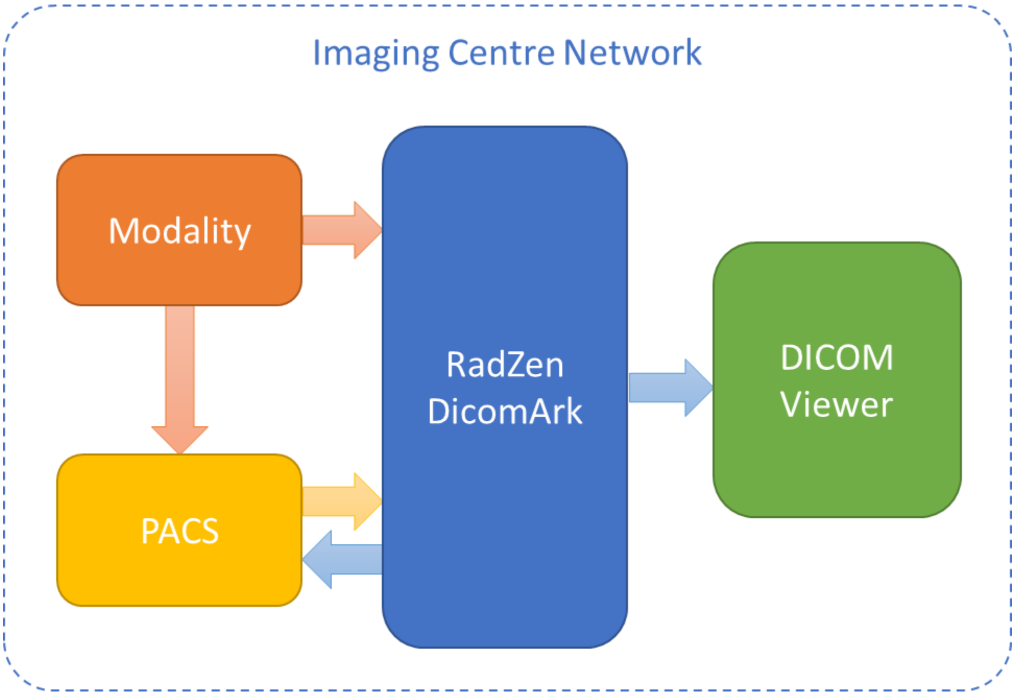
2 Introduction

2.1 What is RadZen DicomArk?

RadZen DicomArk is a simple, low-cost solution for backing up DICOM data. It is virtual Docker appliance that has the sole function of receiving multiple DICOM instances concurrently and storing them.

2.2 Where Does It Fit?

RadZen DicomArk can be used where DICOM data needs to be stored for backup purposes. It does not provide DICOM Query/Retrieve capabilities, but does provide a web-based interface to allow DICOM instances to be downloaded or sent to a DICOM Storage Provider.



2.3 Platforms

RadZen DicomArk is packaged as a Docker image that can be run on any AMD64 or ARM32 platform that is running Docker.

A description of the Community and Enterprise Editions, and the relevant installation instructions for Docker can be found at:

https://docs.docker.com/install/overview/

Some NAS platforms such as Synology and QNAP have built-in Docker support. Make sure the device has at least 2GB of memory installed.

2.4 Basic Concepts

2.4.1 Inbound Server

The Inbound server “listens” on the network for DICOM transmissions addressed to it by network address and Application Entity (AE) Title.

Each transmission usually corresponds to a single DICOM instance being sent from a modality. DICOM instances are received by the DicomArk, registered in a database and then stored on disk.

2.4.2 Send Queue

The Send Queue is responsible for sending retrieved DICOM instances to a configured destination, one at a time. The destination is specified by network address and AE Title.

The Send Queue “wakes up” at regular intervals to process entries on the queue.

2.4.3 Storage and Data Retention Policy

All received instances, the internal database and security certificates are stored on Docker volumes. This means that data will persist between container lifetimes.

The data retention policy can be configured via the Administration Console. DicomArk can be configured to purge instances if one or both of the following conditions are met:

- storage limit is reached
- instance age limit is reached

Instances will be purged in order of oldest study date first.

3 Getting Started

3.1 Before You Begin

For Windows, Mac and Linux computers, a Docker host must be installed on the computer that DicomArk is to be installed on.

A description of the Community and Enterprise Editions, and the relevant installation instructions can be found at:

https://docs.docker.com/install/overview/

If DicomArk is being installed on a NAS (Network Attached Storage) device that supports Docker containers (such as a QNAP TS-x31P2), make sure the device has at least 2GB of memory. Remember to also identify the type of processor running in the device, e.g. ARM, Intel Atom or Intel Celeron, as this will determine whether a variant of the DicomArk docker image will need to be installed.

3.1.1 Docker Compose

Docker Compose provides a convenient way of starting up one or more Docker containers using a docker-compose.yaml configuration file.

Docker Compose is installed by default on Community Edition for Mac and Windows but will need to be installed on Linux computers, and for Enterprise Edition. Instructions can be found here:

https://docs.docker.com/compose/install/

NAS devices usually come with their own container launch and management apps so Docker Compose is not required in these use cases.

3.2 Installation

3.2.1 Windows, Mac and Linux

Installation of a Docker container must be performed from a command-line or terminal. The following command will start a basic instance of DicomArk:

```
$ docker run -d -p 9080:5000 -p 11112:11112 --restart=always --name dicomark-1 \
          -v dicomark-data:/app/data \
          -v dicomark-logs:/app/logs \
          -v dicomark-certs:/app/certs \
          -e "TZ=Australia/Sydney" \
          docker-registry.futurezen.com.au/radzen/dicom-ark:1.1-amd64
```

This will pull the latest AMD64 platform image for DicomArk and run it in a new container

- detached (-d)
- mapped to internal port 11112 (`-p`)
- name the container dicomark-1 (`--name`)
- always restart the container if it fails or if the host restarts `(--restart=always`)

- create and mount persistent data volumes (`-v`) for data, logs and certs

3.2.2 NAS Devices

Refer to the NAS device user manual for launching a Docker container. For devices that have an ARM processor, the ARM 32-bit DicomArk image may be required:

```
docker-registry.futurezen.com.au/radzen/dicom-ark:1.1-arm32
```

3.2.3 Basic Configuration

Refer to the Docker manuals for advanced container configuration, such as attaching multiple virtual network adapters or more advanced use of volumes and bindings.

3.2.3.1 Ports

The DicomArk console runs on port 5000 by default. This can be configured by exposing a different port and mapping it to 5000 using the `-p` option. For example, `-p 18080:5000` exposes port 18080 and maps network traffic to port 5000.

The DicomArk engine runs on port 11112 by default and as with the DicomArk console, a different port may be exposed instead and mapped to port 11112.

3.2.3.2 Container Name

Use the `--name` option to give the container a meaningful name. This name makes it easier to manage the container later.

3.2.3.3 Persistent Data

Docker volumes allow data to be stored between container lifecycles. Using the `-v` option specifies the volume and mount point in the container. The mount points required are as follows:

- `/app/data` : DicomArk database and DICOM instance data
- `/app/logs` : Log files for the web console and DicomArk engine
- `/app/certs` : SSL certificate files uploaded to enable SSL/TLS encryption

3.2.3.4 CORS Origins (Optional)

CORS is a security mechanism to ensure that a web request is from a trusted origin. The web console employs CORS to prevent hacking attacks.

To enable CORS, this must be set to all possible URLs that the web console can be accessed with. Separate each URL with semicolon (;).

For example, if the DicomArk was installed on a docker host with IP address 192.168.100.30 running on port 9080 and had a domain name of “mydcmq.local”, the CORS Origins setting would be:

```
-e "CORS_ORIGINS=http://192.168.100.30:9080;http://mydcmq.local:9080"
```

3.2.3.5 Time Zone

By default, the DicomArk container time zone is set to Universal Time Coordinates (UTC) which happens to be the same as Greenwich Mean Time (GMT) + 0.

To create the container with a different time zone, pass the following option on the docker run command:

```
-e "TZ=MyTimeZone"
```

Replace MyTimeZone with the appropriate time zone as defined in the IANA Time Zone Database, e.g. Australia/Sydney. A full list can be found on Wikipedia at:

https://en.wikipedia.org/wiki/List_of_tz_database_time_zones

3.2.4 (Optional) Launching DicomArk with Docker Compose

Docker Compose provides a convenient way of launching the DicomArk container with a configuration file.

The docker command in section 3.2.1 can be defined as a docker-compose.yaml file as follows:

```
version: "3"
services:
  dicomark:
    image: docker-registry.futurezen.com.au/radzen/dicom-ark:1.1-amd64
    ports:
      - "9080:5000"
      - "11112:11112"
    network_mode: "bridge"
    volumes:
      - dicomark-data:/app/data
      - dicomark-logs:/app/logs
      - dicomark-certs:/app/certs
    environment:
      - TZ=Australia/Sydney
      - CORS_ORIGINS=http://192.168.1.10:9080
volumes:
  dicomark-data:
  dicomark-logs:
  dicomark-certs:
```

To start the DicomArk container, run the command from the same directory as the docker-compose.yaml file:

```
$ docker-compose up -d
```

The advantages of using Docker Compose are:

- no need to script the launch of the container
- the configuration is captured in the docker-compose.yaml file
- multiple DicomArk containers can be launched at once
- Docker Compose can manage container configuration if the docker-compose.yaml configuration is changed

Refer to the Docker Compose documentation for more information:

https://docs.docker.com/compose/overview/

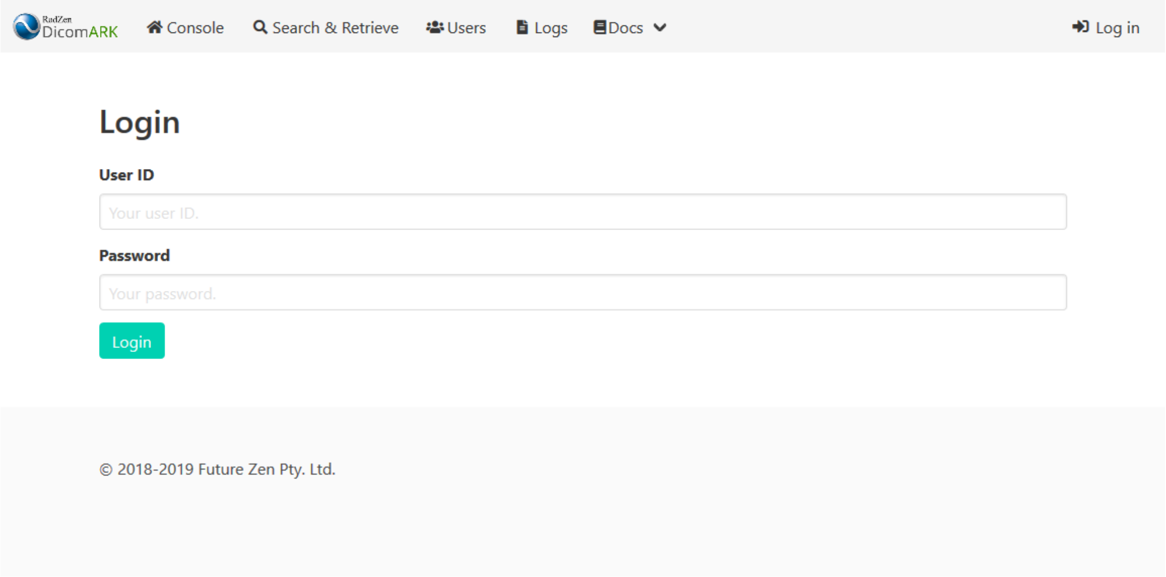
4 The Administration Console

4.1 Accessing the Console

To access the Administration Console, open a web-browser and visit:

```
http://<DicomArk_address>:<DicomArk_port>/
```

The login page will be displayed, prompting for a username and password.



Login

User ID

Your user ID.

Password

Your password.

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4.1.1 System Administrator Login

This is user profile is created by default. It provides full access to the DicomArk configuration and management of queues. Keep these credentials safe.

Username	admin
Default Password	radzen

IMPORTANT! For security, make sure you log in and change your password immediately. (see User Manual Section 4.3 Changing Your Password).

5 Support

5.1 Support Contact

Please direct all support requests via our support form at:

https://www.futurezen.com.au/support

A response should be received within 1-2 working days.

5.2 Warranty

Software defects identified within 12 months of purchasing a license will be rectified free of charge.

All other support requests will be charged according to the fee schedule on the Future Zen website.