PACEdge

IMPORTANT PRODUCT INFORMATION

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Warnings and Caution Notes as Used in this Publication

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Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

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Note: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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Introduction

PACEdge processing maximizes the value of your data by improving operational reliability, safety, and energy. PACEdge provides all aspects of edge processing and simplifies your IIoT application development, deployment, and administration. All components necessary in the IIoT application lifecycle are brought together in one package to provide a unified interface to decrease your development time and increase your deployable footprint.

This document serves as a resource for users that wish to quickly locate notes about improvements, bugs, or resolved issues as well as any auxiliary information about the PACEdge software.

Related Information

PACEdge User's Manual	GFK-3178
RXi2-LP Quick Start Guide	GFK-3074
RXi2-BP Quick Start Guide	GFK-3196
PACEdge Secure Deployment Guide	GFK-3197
RXi2-BP User's Manual	GFK-3187
RXi2-BP Secure Deployment Guide	GFK-3200

Important Product Information for this Release

None

Release History

PACEdge SW Version	Date	Description
2.0.1	Oct 2021	Updates to Restrictions and Open Issues Section: PACEdge container logging mechanism, especially for InfluxDB, will continue to write logs into disc, eventually completely filling it up.
2.0.1	Sep 2020	Initial Release

Restrictions and Open Issues

PACEdge container logging mechanism, especially for InfluxDB, will continue to write logs into disc, eventually completely filling it up.

Note: this configuration setting has been already made in upcoming PACEdge 2.1 release. Please consider upgrading to new PACEdge version as soon as it becomes available.

To change the maximum allowable disc space for logging will require modification of few docker files. Alternatively, one can use a script, which will automatically perform all required file modifications

1. Manual Configuration change steps:
   - To limit disc space consumed by the PACEdge container logging, go to Cockpit-> Terminal
   - Enter: **cd PACEdgeSoftwareInstallation.V20/setup/docker-components/**
   - Enter: ls -l
     to see all the files and folders. You will have to repeat following step for each file, except **compose.yml**, **volumes.yml** and **network.yml**

Figure 1: List Files

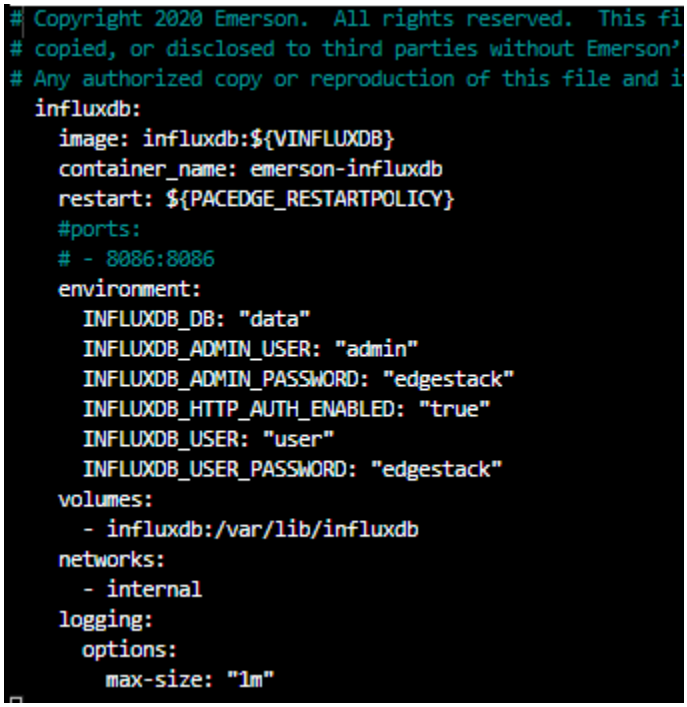
```
admin@pacedge:~/PACEdgeSoftwareInstallation.V20/setup/docker-components$ ls -l
total 68
-rw-rw-r-- 1 admin admin  675 Sep  9  2020 aes-daemon.yml
-rw-rw-r-- 1 admin admin 1378 Sep  9  2020 chronograf.yml
-rw-rw-r-- 1 admin admin   26 Sep  9  2020 compose.yml
-rw-rw-r-- 1 admin admin 1449 Sep  9  2020 grafana.yml
-rw-rw-r-- 1 admin admin  761 Sep  9  2020 influxdb.yml
-rw-rw-r-- 1 admin admin  505 Sep  9  2020 mqtt-internal-ipc.yml
-rw-rw-r-- 1 admin admin  477 Sep  9  2020 mqtt.yml
-rw-rw-r-- 1 admin admin  661 Sep  9  2020 mysql.yml
-rw-rw-r-- 1 admin admin   25 Sep  9  2020 network.yml
-rw-rw-r-- 1 admin admin 1757 Sep  9  2020 nginx.yml
-rw-rw-r-- 1 admin admin 1405 Sep  9  2020 nodered.yml
-rw-rw-r-- 1 admin admin  507 Sep  9  2020 php.yml
-rw-rw-r-- 1 admin admin 1653 Sep  9  2020 portainer.yml
-rw-rw-r-- 1 admin admin 1135 Sep  9  2020 traefik.yml
-rw-rw-r-- 1 admin admin  196 Sep  9  2020 volumes.yml
-rw-rw-r-- 1 admin admin  718 Sep  9  2020 whoami2.yml
-rw-rw-r-- 1 admin admin  977 Sep  9  2020 whoami.yml
```

- Repeat for each file:
  - Type: **nano filename.yml**
  - At the end of text, add the following statement. This will limit the log file size to 1Mbyte. You can change the value if desired:

```
logging:
  options:
    max-size: "1m"
```

- After modification is done, click ctrl+x, then enter Y to save the changes
  Note: please pay attention to indentation, it needs to line up with other statements in the file (4x spaces prior to word "logging"). Following is an example of influxdb.yml file:

Figure 2: ExampleFile influxdb.yml



```
# Copyright 2020 Emerson.  All rights reserved.  This fi
# copied, or disclosed to third parties without Emerson'
# Any authorized copy or reproduction of this file and i
  influxdb:
    image: influxdb:${VINFLUXDB}
    container_name: emerson-influxdb
    restart: ${PACEDGE_RESTARTPOLICY}
    #ports:
    # - 8086:8086
    environment:
      INFLUXDB_DB: "data"
      INFLUXDB_ADMIN_USER: "admin"
      INFLUXDB_ADMIN_PASSWORD: "edgestack"
      INFLUXDB_HTTP_AUTH_ENABLED: "true"
      INFLUXDB_USER: "user"
      INFLUXDB_USER_PASSWORD: "edgestack"
    volumes:
      - influxdb:/var/lib/influxdb
    networks:
      - internal
    logging:
      options:
        max-size: "1m"
```

- Once modifications are done, enter: **cd ../../** to change working directory
- Enter command: ./config-compose.sh , which will open dialogue to select which docker containers should be included. Make no changes, just click on Tab to select dialogue "OK" and hit enter.

2. Automated configuration change via script
   - As alternative to all the manual steps, a script-file **packed20logging.sh**, located on the SalesForce PACEdge landing page, simplifies this procedure. To execute this script:
     - Download script from Emerson SalesForce PACEdge landing page to USB stick
     - Plug USB stick into PACEdge unit, open Cockpit, go to Storage tab and Mount the usb stick.
     - Then go to Terminal, login as superuser with admin password, change to directory where USB stick was mounted, extract the file and execute the script.
       - **cd /mnt/usb1**
       - **sudo su**
       - **unzip PACEdgeV20loggingFix.zip**
       - **./PACEdgeV20loggingFix.sh**
3. Finally restart PACEdge containers by:
   - Make sure you are in directory: **admin@pacedge:~/PACEdgeSoftwareInstallation.V20/**
   - Enter command: **docker-compose down**
   - Then command: **docker-compose up -d**

4. If you like to verify if change was applied successfully, in Terminal window, execute following commands:
    - cd /home/admin/PACEdgeSoftwareInstallation.V20/
    - nano docker-compose.yml
    - check that logging entry was applied to each container entry. For example, Node RED entry should look like this:

Figure 3: Node RED Entry Example

```
nodered:
  build: ./emerson-node-red
  image: emerson-node-red:${VNODERED}
  container_name: emerson-nodered
  restart: ${PACEDGE_RESTARTPOLICY}
  environment:
    ADMIN_AUTH_USERNAME: ${NODE_RED_ADMIN_AUTH_USERNAME}
    ADMIN_AUTH_PASSWORD: ${NODE_RED_ADMIN_AUTH_PASSWORD}
    HTTP_ROOT: "/nodered"
    MQTT_HOST: "mqtt://mqtt-internal-ipc:1883"
    #DEBUG: "*"
  #ports:
    #- 1880:1880
  labels:
    - "traefik.enable=true"
    - "traefik.http.routers.nodered.rule=PathPrefix(`/nodered`)"
    - "traefik.http.services.nodered.loadbalancer.server.port=1880"
    - "traefik.http.routers.nodered.entrypoints=web"
    - "traefik.http.routers.nodered.service=nodered"
    - "traefik.http.routers.nodered.middlewares=redirect-https-nodered"
    - "traefik.http.middlewares.redirect-https-nodered.redirectscheme.scheme=https"
    - "traefik.http.routers.noderedS.rule=PathPrefix(`/nodered`)"
    - "traefik.http.routers.noderedS.entrypoints=webs"
    - "traefik.http.routers.noderedS.tls=true"
  volumes:
    - nodered:/data
  networks:
    - internal
  logging:
    options:
      max-size: "1m"
```

Operational Notes

Access Ports

PACEdge Software needs to access the following ports:

- 22 SSH
- 80 HTTP
- 443 HTTPS
- 9090 Cockpit
- 1883 MQTT
- 8883 MQTT-TLS
- 4840 OPC-UA

These ports (especially HTTP and HTTPS) therefore cannot be used by another 3rd party Software package, like HTTP Server Apache2. In a worst-case scenario, you will not be able to access the PACEdge applications at all. Please keep this in mind when adding 3rd party software to the PACEdge system and configure them appropriately by assigning different ports.

IP-Addresses

On preinstalled systems, the first ethernet interface is configured to use a static IP-Address (192.168.3.100) and DHCP. Therefore (if the first ethernet interface is connected to a DHCP server) two IP-Addresses are usable on this interface (IP-Address provided by DHCP server and static IP-Address 192.168.3.100).

DHCP IP-Address (and static address) is shown on the Linux console or can be determined by the Linux command **IP addr**.

If you are using several PACEdge installations in the same network, it is strongly recommended to change the static IP-Address. Otherwise, multiple devices with the same IP-Address (192.168.3.100) in the same network can lead to network conflicts with unpredictable network behavior. The static IP-Address can be configured in the file: */etc/NetworkManager/system-connections/pacedge.nmconnection* or with PACEdge Cockpit application (Network menu)

PACEdge Webpage

The PACEdge Webpage can be accessed by simply entering the IP-Address (see above) in a Web-Browser. At the first call of the page, you will be asked to accept the Emerson End User License Agreement (EULA). After acceptance, you will be forwarded to the PACEdge dashboard offering links to the PACEdge applications. Also, at the first call, you will get a security warning from your internet browser. This happens due to self-signed certificates used by PACEdge and cannot be avoided for systems not using a domain name (and the customer domain name is not known during installation).

Passwords

Default User and Passwords

The default user for Linux and all PACEdge APPs (Node-Red, Grafana, ...) is:

admin

The default password for admin user in Linux and all PACEdge APPs is:

edgestack

When logging in the first time into Linux, either via SSH or via Cockpit, you will be required to change the password for Linux. When changing the password via an SSH login session, you probably will be disconnected after the password change. Please reconnect and log in again with the new password.
The new password is valid only for Linux login, not for the PACEdge APPs.

Changing APPs passwords and users

Most applications allow user management via the Web interface. Chronograf and Node-Red passwords need to be changed by editing configuration files. Please see the PACEdge´s Secure Deployment Guide for details.

Firewall

PACEdge comes with a firewall management tool *firewalld* preinstalled. To avoid *firewalld* causing access problems, *firewalld* is disabled by default. You can enable *filewalld* via the Cockpit GUI:
Networking->Firewall->enable switch
If enabling the firewall via Cockpit you either need to reboot the system or to restart Docker to access the PACEdge Applications again. Docker restart can be achieved either by the Cockpit GUI:

Services->docker->restart (3 dots next to the stop/disable switch)

or the CLI command:

sudo systemctl restart docker

PACEdge Applications

This section will cover known problems, obscurities, and specific information about PACEdge applications. It will not describe how to use these tools. Please refer to the online documentation of the particular application for usage information.

Cockpit

- As Cockpit needs direct Operating System access it is not installed as a docker container, but directly on the Linux file system. Therefore, Cockpit also is not routed through the Traefik reverse proxy as all the other PACEdge applications. This, in turn, causes an extra security warning when browsing to Cockpit the first time (see also above “PACEdge Webpage”).
- If trying to change the IP-Address of an interface you are currently connected to, Cockpit will not change the IP address if the requested change will cause your connection to Cockpit to be terminated (self-protection).
- If changing the system time, you should also change the date via the date drop-down box. Otherwise, you might get an error about invalid date format (language-dependent).
- If you want to get access to the list of available time zones, you need to clear the input field by clicking the “X” on the right end of the input field.

PACEdge Software Recovery – Emerson System Installation

On preinstalled systems you might lock yourself out from Linux, Linux fails to start following a misconfiguration, or you simply want to return to a clean system. In such cases, PACEdge Linux (Ubuntu + PACEdge) can be restored to its original manufacturer settings by using the Emerson System Installation aka PACEdge Software Recovery.

For this recovery, Emerson provides a package called *EmersonSystemInstallation.<Version>.zip*, which contains a bootable Linux, the recovery archives, and some configuration files.
Please unzip the archive to a USB-Stick. The top-level directory of USB-Stick then should contain a directory called *EFI*, a Linux Kernel and Ramdisk (*vmlinuz.efi, initrd.img*), two archives (*.tgz*), an installation configuration file (*unattendedinstall*), and some other configuration files.

Recovery Procedure

Please insert the USB-stick into an Emerson IPC and boot from the USB-Stick in EFI mode (press F7 during bootup and select UEFI: <USB-Stick-Name> from the boot menu).
During installation, you will be asked about the task you want to perform and on which drive you to want to install Ubuntu/PACEdge.

For Recovery please select the **Install PACEdge** action in the semi-graphic dialogue. For the destination disk, you probably will be offered just the system's build-in disk (sda). In case you are offered multiple disks make sure to select the correct one by evaluating the disk parameters shown in the dialogue.

Note: All data on the selected disk will be lost, as the drive is partitioned and formatted during installation!

After the installation has finished remove the USB-Stick and reboot the system.

Unattended Recovery Procedure

If you want to install/recover PACEdge on an Emerson IPC without any user interaction, you need to edit a configuration file.
Please prepare a USB-Stick as described above, then edit the file *unattendedinstall* on the stick and remove the comment from the first line (#destdisk="sda"). It now should look like this:
destdisk="sda"
Save the file, insert the USB-Stick in a System, and boot from USB-Stick as described above.
A fully unattended installation is now performed and PACEdge is installed on the configured disk (here sda).
Please make sure the configured disk is really the disk you want to install to (in most cases *sda* should be appropriate).

Note: All data on the configured disk will be lost, as drive is partitioned and formatted during installation!

Backup Procedure

When selecting the **Backup PACEdge System** action, the whole PACEdge system (root and boot partition) are stored in two archives on the USB-Stick you booted from. Please use a USB-Stick with appropriate free space to capture the archives (10 Gb min). As the archives are packed, the backup procedure can take quite a while depending on the performance of your hardware.
Backup will only work for preinstalled systems or systems installed with the *EmersonSystemInstallation* package. You can backup not only freshly installed systems but also systems that have been configured for a specific task with flows and views.

You can restore the backups by editing the *unattendedinstall* file on your USB-Stick. Please replace the installfnprefix entry with the appropriate name of your backup. The line should look like this:
installfnprefix = backup.2020-09-02-13-18
Please do not add the trailing extensions *gptX.tgz* to the backup name.
After saving the *unattendedinstall* file, boot your system from USB-Stick and follow the System Installation instructions above.

Note: Restoring the Backup will delete all data on the selected destination disk!

General Contact Information

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