# Superviseur - Daemon

1.0

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# Chapitre 1

# KVMSuperviseur

Le superviseur est une suite de trois logiciels permettant de monitorer des machines virtuelles tournant sous Linux-KVM.

Il contient un daemon qui se charge de récupérer les données sur l'hyperviseur et sur ses machines virtuelles.

Il contient aussi un collecteur qui se charge de récupérer les données en provenance des daemons puis de les renvoyer aux afficheurs connectés.

L'afficheur se connecte à un collecteur pour pouvoir visualiser l'état de santé des hyperviseurs et de leurs machines virtuelles.

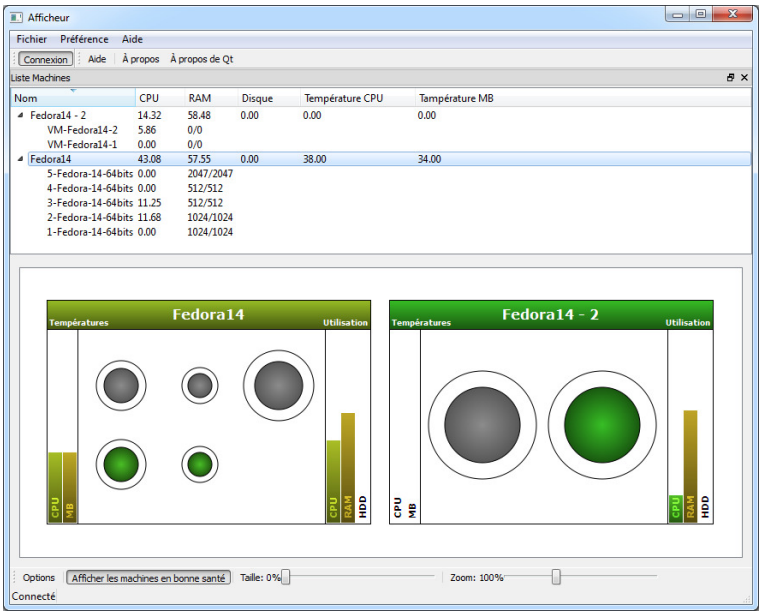


FIGURE 1.1 – Capture d'écran de l'afficheur

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KVMSuperviseur et ses logiciels sont distribués sous les termes de la license GNU GPL.

## 1.2 Platformes

Le daemon est codé en Python et est prévu pour fonctionner sur Linux.

Le collecteur et l'afficheur devraient fonctionner sur toutes les plateformes supportées par Qt >= 4.7.

## 1.3 Installation

Pour compiler le collecteur et l'afficheur il faut disposer des bibliothèques de Qt >= 4.7.

La bibliothèque QJson est également nécessaire.

Pour effectuer la compilation vous devez vous placer dans le répertoire de l'application puis exécuter les commandes suivantes :

```
qmake
make
```

## 1.4 Crédits :

**Auteur :**

Schaub Lionel

## Chapitre 2

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# Chapitre 3

# Index des espaces de nommage

## 3.1 Liste des paquetages

Liste des paquetages avec une brève description (si disponible) :

# Chapitre 4

# Index des classes

## 4.1 Hiérarchie des classes

Cette liste d'héritage est classée approximativement par ordre alphabétique :

# Chapitre 5

# Index des classes

## 5.1 Liste des classes

Liste des classes, structures, unions et interfaces avec une brève description :

# Chapitre 6

# Index des fichiers

## 6.1 Liste des fichiers

Liste de tous les fichiers avec une brève description :

# Chapitre 7

# Documentation des espaces de nommage

## 7.1 Paquetage daemon

### Classes

- class NetworkCommunication
  *Classe de communication réseau.*

- class UDPScoketCommunication
  *Classe de communication réseau UDP.*

- class AbstractInfos
  *Classe de base pour les classes récoltant des informations.*

- class HostInfos
  *Classe de base pour les classes récoltant des informations.*

- class VMInfos
  *Classe de base pour les classes récoltant des informations.*

### Variables

- tuple hosti = HostInfos()
  *Point d'entrée du logiciel Cette fonction crée les instances des objets et appelle les méthodes infos().*

- tuple vmi = VMInfos()
- tuple comm = UDPScoketCommunication()
- tuple infos = hosti.infos()
- tuple jsonData = json.dumps(infos)

### 7.1.1 Documentation des variables

#### 7.1.1.1 tuple daemon.comm = UDPScoketCommunication()

Définition à la ligne 343 du fichier daemon.py.

#### 7.1.1.2 tuple daemon.hosti = HostInfos()

Point d'entrée du logiciel Cette fonction crée les instances des objets et appelle les méthodes infos().

Elle crée ensuite la chaîne JSON et l'envoie aux collecteurs.

Puis elle attend un certain temps avant de recommencer.

**Renvoie**

Définition à la ligne 341 du fichier daemon.py.

#### 7.1.1.3 tuple daemon.infos = hosti.infos()

Définition à la ligne 347 du fichier daemon.py.

#### 7.1.1.4 tuple daemon.jsonData = json.dumps(infos)

Définition à la ligne 349 du fichier daemon.py.

#### 7.1.1.5 tuple daemon.vmi = VMInfos()

Définition à la ligne 342 du fichier daemon.py.

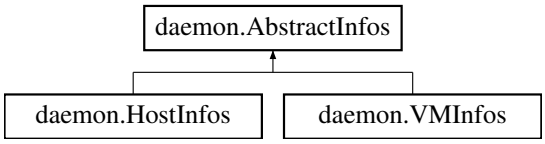
# Chapitre 8

# Documentation des classes

## 8.1 Référence de la classe daemon.AbstractInfos

Classe de base pour les classes récoltant des informations.

Graphe d'héritage de daemon.AbstractInfos :




### Fonctions membres publiques

- def __init__
  *Constructeur.*
- def infos
  *Méthode qui renvoie des informations sous la forme d'une liste ou d'un dict.*

### 8.1.1 Description détaillée

Classe de base pour les classes récoltant des informations. Cette classe est la classe de base pour les classes récoltant des informations. Chaque classe fille doit implémenter la méthode infos.

Définition à la ligne 94 du fichier daemon.py.

### 8.1.2 Documentation des fonctions membres

#### 8.1.2.1 def daemon.AbstractInfos.__init__ ( *self*)

Constructeur.

Réimplémentée dans daemon.HostInfos, et daemon.VMInfos.

Définition à la ligne 97 du fichier daemon.py.

#### 8.1.2.2 def daemon.AbstractInfos.infos ( *self*)

Méthode qui renvoie des informations sous la forme d'une liste ou d'un dict.

Cette méthode est purement virtuelle et doit être réimplémentée par les classes filles.

**Renvoie**

des informations sous la forme d'une liste ou d'un dict.

Réimplémentée dans daemon.HostInfos, et daemon.VMInfos.

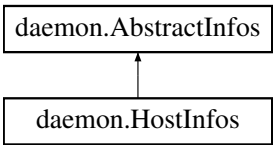
Définition à la ligne 103 du fichier daemon.py.

La documentation de cette classe a été générée à partir du fichier suivant :
– daemon.py

## 8.2 Référence de la classe daemon.HostInfos

Classe de base pour les classes récoltant des informations.

Graphe d'héritage de daemon.HostInfos :




### Fonctions membres publiques

– def __init__
*Constructeur.*

– def nomMachine
*Renvoie le nom de la machine.*

– def temperatures
*Lit la température du cpu et de la carte mère.*

– def RAMInfos
*Renvoie l'utilisation de la mémoire RAM en pourcents.*

– def CPUIdleTime
*Renvoie le temps pendant lequel le CPU était innactif depuis le démarrage du système.*

– def CPUInfos
*Retourne l'utilisation du CPU en pourcents.*

– def disqueTime
*Retourne la valeur du temps CPU passé dans les accès disques.*

– def disqueInfos
*Retourne l'utilisation du disque en pourcents.*

– def infos
*Retourne les informations sur l'hôte sous la forme d'un dict.*

### Attributs publics

– nomHyperviseur
– temperatureCPU
– temperatureMB
– CPUTime
– CPUMesureTime
– DisqueTime
– DisqueMesureTime

## Attributs publics statiques

– tuple CPUTime = int()
*Temps CPU.*

– tuple CPUMesureTime = float()
*Date de la dernière mesure de la charge CPU.*

– tuple DisqueTime = int()
*Temps CPU passé dans les accès disques.*

– tuple DisqueMesureTime = float()
*Date de la dernière mesure de la charge disque.*

– tuple temperatureCPU = float(0)
*Température du CPU.*

– tuple temperatureMB = float(0)
*Température de la carte mère.*

### 8.2.1 Description détaillée

Classe de base pour les classes récoltant des informations. Cette classe est la classe de base pour les classes récoltant des informations. Chaque classe fille doit implémenter la méthode infos.

Définition à la ligne 111 du fichier daemon.py.

### 8.2.2 Documentation des fonctions membres

#### 8.2.2.1 def daemon.HostInfos.__init__ ( *self*)

Constructeur.

Le constructeur initialise diverses valeurs.

Réimplémentée à partir de daemon.AbstractInfos.

Définition à la ligne 127 du fichier daemon.py.

#### 8.2.2.2 def daemon.HostInfos.CPUIdleTime ( *self*)

Renvoie le temps pendant lequel le CPU était innactif depuis le démarrage du système.

La valeur est obtenue gâce au fichier /proc/stat.

**Renvoie**

la valeur du temps CPU passé en innactivité.

Définition à la ligne 168 du fichier daemon.py.

#### 8.2.2.3 def daemon.HostInfos.CPUInfos ( *self*)

Retourne l'utilisation du CPU en pourcents.

Cette méthode calcule la moyenne du pourcentage d'utilisation du CPU depuis son dernier appel.

**Renvoie**

l'utilisation du CPU en pourcents.

Définition à la ligne 177 du fichier daemon.py.

#### 8.2.2.4 def daemon.HostInfos.disqueInfos ( *self*)

Retourne l'utilisation du disque en pourcents.

Cette méthode calcule la moyenne du pourcentage d'utilisation du disque depuis son dernier appel.

**Renvoie**

l'utilisation du disque en pourcents.

Définition à la ligne 199 du fichier daemon.py.

#### 8.2.2.5 def daemon.HostInfos.disqueTime ( *self*)

Retourne la valeur du temps CPU passé dans les accès disques.

La valeur est obtenue grâce au fichier /proc/diskstats.

**Renvoie**

la valeur du temps CPU passé dans les accès disques.

Définition à la ligne 190 du fichier daemon.py.

#### 8.2.2.6 def daemon.HostInfos.infos ( *self*)

Retourne les informations sur l'hôte sous la forme d'un dict.

Cett méthode appelle les autres méthodes de la classe pour récupérer les informations sur l'hôte.

Elle crée ensuite le dict et y stocke les informations.

**Renvoie**

les informations sur l'hôte sous la forme d'un dict.

Réimplémentée à partir de daemon.AbstractInfos.

Définition à la ligne 212 du fichier daemon.py.

#### 8.2.2.7 def daemon.HostInfos.nomMachine ( *self*)

Renvoie le nom de la machine.

**Renvoie**

le nom de la machine.

Définition à la ligne 135 du fichier daemon.py.

#### 8.2.2.8 def daemon.HostInfos.RAMInfos ( *self*)

Renvoie l'utilisation de la mémoire RAM en pourcents.

Cette méthode calcule l'utilisation de la mémoire RAM grâce aux informations contenues dans /proc/meminfo.

**Renvoie**

l'utilisation de la mémoire RAM en pourcents.

Définition à la ligne 155 du fichier daemon.py.

#### 8.2.2.9 def daemon.HostInfos.temperatures ( *self*)

Lit la température du cpu et de la carte mère.

Cette méthode lit la température du cpu et de la carte mère puis elle les stocke dans les propriétés temperatureCPU et temperatureMB.

Définition à la ligne 143 du fichier daemon.py.

### 8.2.3 Documentation des données membres

#### 8.2.3.1 daemon.HostInfos.CPUMesureTime

Définition à la ligne 181 du fichier daemon.py.

#### 8.2.3.2 tuple daemon.HostInfos.CPUMesureTime = float() `[static]`

Date de la dernière mesure de la charge CPU.

Définition à la ligne 115 du fichier daemon.py.

#### 8.2.3.3 daemon.HostInfos.CPUTime

Définition à la ligne 180 du fichier daemon.py.

#### 8.2.3.4 tuple daemon.HostInfos.CPUTime = int() `[static]`

Temps CPU.

Définition à la ligne 113 du fichier daemon.py.

#### 8.2.3.5 daemon.HostInfos.DisqueMesureTime

Définition à la ligne 203 du fichier daemon.py.

#### 8.2.3.6 tuple daemon.HostInfos.DisqueMesureTime = float() [static]

Date de la dernière mesure de la charge disque.

Définition à la ligne 119 du fichier daemon.py.

#### 8.2.3.7 daemon.HostInfos.DisqueTime

Définition à la ligne 202 du fichier daemon.py.

#### 8.2.3.8 tuple daemon.HostInfos.DisqueTime = int() [static]

Temps CPU passé dans les accès disques.

Définition à la ligne 117 du fichier daemon.py.

#### 8.2.3.9 daemon.HostInfos.nomHyperviseur

Définition à la ligne 130 du fichier daemon.py.

#### 8.2.3.10 daemon.HostInfos.temperatureCPU

Définition à la ligne 149 du fichier daemon.py.

#### 8.2.3.11 tuple daemon.HostInfos.temperatureCPU = float(0) [static]

Température du CPU.

Définition à la ligne 121 du fichier daemon.py.

#### 8.2.3.12 daemon.HostInfos.temperatureMB

Définition à la ligne 150 du fichier daemon.py.

#### 8.2.3.13 tuple daemon.HostInfos.temperatureMB = float(0) [static]

Température de la carte mère.

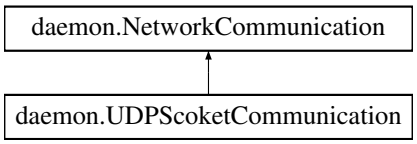
Définition à la ligne 123 du fichier daemon.py.

La documentation de cette classe a été générée à partir du fichier suivant :
– daemon.py

## 8.3 Référence de la classe daemon.NetworkCommunication

Classe de communication réseau.

Graphe d'héritage de daemon.NetworkCommunication :




### Fonctions membres publiques

- def __init__
  *Constructeur.*
- def envoyer
  *Méthode qui envoie les données msg aux collecteurs.*
- def recupCollecteurs
  *Récupère la liste des collecteurs depuis le fichier de configuration.*

### Attributs publics statiques

- string FILENAME = 'collecteurs.conf.txt'
  *Nom du fichier contenant la liste des collecteurs.*
- tuple DEFAULTPORT = int(55000)
  *Port par défaut.*
- tuple collecteurs = list()
  *Liste contenant l'adresse et le port des collecteurs.*

### 8.3.1 Description détaillée

Classe de communication réseau. Cette classe est la classe de base permettant d'envoyer les données via le réseau.

Définition à la ligne 18 du fichier daemon.py.

### 8.3.2 Documentation des fonctions membres

#### 8.3.2.1 def daemon.NetworkCommunication.__init__ ( *self*)

Constructeur.

Il exécute la méthode recupCollecteurs().

Réimplémentée dans daemon.UDPScoketCommunication.

Définition à la ligne 31 du fichier daemon.py.

#### 8.3.2.2 def daemon.NetworkCommunication.envoyer ( *self*, *msg*)

Méthode qui envoie les données msg aux collecteurs.

Cette méthode est purement virtuelle et doit être réimplémentée par les classes filles.

Réimplémentée dans daemon.UDPScoketCommunication.

Définition à la ligne 36 du fichier daemon.py.

#### 8.3.2.3 def daemon.NetworkCommunication.recupCollecteurs ( *self*)

Récupère la liste des collecteurs depuis le fichier de configuration.

Cette méthode récupère la list des collecteurs depuis le fichier de configuration et les stocke dans la liste 'collecteurs' sous la forme d'un dictionnaire avec comme champ 'ip' et 'port'.

Définition à la ligne 41 du fichier daemon.py.

### 8.3.3 Documentation des données membres

#### 8.3.3.1 tuple daemon.NetworkCommunication.collecteurs = list() `[static]`

Liste contenant l'adresse et le port des collecteurs.

Définition à la ligne 27 du fichier daemon.py.

#### 8.3.3.2 tuple daemon.NetworkCommunication.DEFAULTPORT = int(55000) `[static]`

Port par défaut.

Définition à la ligne 24 du fichier daemon.py.

#### 8.3.3.3 string daemon.NetworkCommunication.FILENAME = 'collecteurs.conf.txt' `[static]`

Nom du fichier contenant la liste des collecteurs.

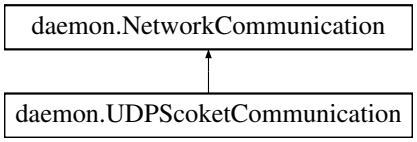
Définition à la ligne 21 du fichier daemon.py.

La documentation de cette classe a été générée à partir du fichier suivant :
– daemon.py

## 8.4 Référence de la classe daemon.UDPScoketCommunication

Classe de communication réseau UDP.

Graphe d'héritage de daemon.UDPScoketCommunication :




### Fonctions membres publiques

– def __init__
*Constructeur.*

– def envoyer
*Méthode qui envoie les données msg aux collecteurs via un socket UDP.*

### 8.4.1 Description détaillée

Classe de communication réseau UDP. Cette classe implémente la communication réseau via un socket UDP.

Définition à la ligne 64 du fichier daemon.py.

### 8.4.2 Documentation des fonctions membres

#### 8.4.2.1 def daemon.UDPScoketCommunication.__init__ ( *self*)

Constructeur.

Il appelle le constructeur de la classe parente puis ajoute un champs seqNb contenant le numéro de séquence courant pour chaque collecteur. Ce numéro est initialisé à 0.

Réimplémentée à partir de daemon.NetworkCommunication.

Définition à la ligne 69 du fichier daemon.py.

#### 8.4.2.2 def daemon.UDPScoketCommunication.envoyer ( *self*, *msg*)

Méthode qui envoie les données msg aux collecteurs via un socket UDP.

Cette méthode envoie les données à chaque collecteur de la liste et incrémente le numéro de séquence.

### Paramètres

***msg*** données à envoyer.

Réimplémentée à partir de daemon.NetworkCommunication.

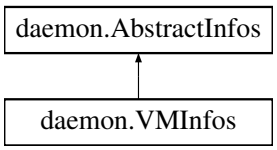
Définition à la ligne 77 du fichier daemon.py.

La documentation de cette classe a été générée à partir du fichier suivant :
– daemon.py

## 8.5 Référence de la classe daemon.VMInfos

Classe de base pour les classes récoltant des informations.

Graphe d'héritage de daemon.VMInfos :




### Fonctions membres publiques

- def __init__
  *Constructeur.*
- def connexion
  *Se connecte à libvirt.*
- def listeVM
  *Génère la liste des machines virtuelles.*
- def utilisationCPU
  *Retourne l'utilisation du CPU en pourcents pour la VM passée en paramètre.*
- def utilisationCPUv2
  *Cette méthode a la même fonction que la méthode utilisationCPU() mais utilise un algorithme différent.*
- def infos
  *Retourne les informations sur les machines virtuelles sous la forme d'une liste contenant des dict.*

### Attributs publics

- nbpCPU
- pCPUInfos
- VMs

### Attributs publics statiques

- Conn = None
- tuple VMs = list()
- tuple nbpCPU = int()
- tuple CPUTime = dict()
- tuple pCPUInfos = float()
- tuple pCPUIdleTime = dict()
- tuple Mesuretime = dict()
- tuple hostinf = HostInfos()

### 8.5.1 Description détaillée

Classe de base pour les classes récoltant des informations. Cette classe est la classe de base pour les classes récoltant des informations. Chaque classe fille doit implémenter la méthode infos.

Définition à la ligne 230 du fichier daemon.py.

### 8.5.2 Documentation des fonctions membres

#### 8.5.2.1 def daemon.VMInfos.__init__ ( *self*)

Constructeur.

Le constructeur initialise diverses valeurs.

Réimplémentée à partir de daemon.AbstractInfos.

Définition à la ligne 242 du fichier daemon.py.

#### 8.5.2.2 def daemon.VMInfos.connexion ( *self*)

Se connecte à libvirt.

Cette méthode ouvre une connexion avec l'API libvirt.

Définition à la ligne 251 du fichier daemon.py.

#### 8.5.2.3 def daemon.VMInfos.infos ( *self*)

Retourne les informations sur les machines virtuelles sous la forme d'une liste contenant des dict.

Cett méthode appelle, pour chaque VM, les autres méthodes de la classe pour récupérer les informations.

Elle crée ensuite le dict et y stocke les informations de la VM.

Elle ajoute ensuite ce dict à la liste.

**Renvoie**

les informations sur l'hôte sous la forme d'un dict.

Réimplémentée à partir de daemon.AbstractInfos.

Définition à la ligne 315 du fichier daemon.py.

#### 8.5.2.4 def daemon.VMInfos.listeVM ( *self*)

Génère la liste des machines virtuelles.

Utilise libvirt pour lister les machines virtuelles démarrées et arrêtées, puis stocke la liste dans la propriété VMs.

Définition à la ligne 259 du fichier daemon.py.

#### 8.5.2.5 def daemon.VMInfos.utilisationCPU ( *self*, *VM*)

Retourne l'utilisation du CPU en pourcents pour la VM passée en paramètre.

Cette méthode calcule la moyenne du pourcentage d'utilisation du CPU d'une machine virtuelle depuis son dernier appel.

**Renvoie**

l'utilisation du CPU en pourcents.

Définition à la ligne 269 du fichier daemon.py.

#### 8.5.2.6 def daemon.VMInfos.utilisationCPUv2 ( *self*, *VM*)

Cette méthode a la même fonction que la méthode utilisationCPU() mais utilise un algorithme différent.

Cette méthode calcule le pourcentage d'utilisation du CPU de la VM en prenant en compte le temps qu'elle avait à disposition.

En résumé elle soustrait le temps utilisé par l'hôte et les autres VMs.

**Renvoie**

l'utilisation du CPU en pourcents.

Définition à la ligne 286 du fichier daemon.py.

### 8.5.3 Documentation des données membres

#### 8.5.3.1 daemon.VMInfos.Conn = None `[static]`

Définition à la ligne 231 du fichier daemon.py.

#### 8.5.3.2 tuple daemon.VMInfos.CPUTime = dict() `[static]`

Définition à la ligne 234 du fichier daemon.py.

#### 8.5.3.3 tuple daemon.VMInfos.hostinf = HostInfos() `[static]`

Définition à la ligne 238 du fichier daemon.py.

#### 8.5.3.4 tuple daemon.VMInfos.Mesuretime = dict() `[static]`

Définition à la ligne 237 du fichier daemon.py.

#### 8.5.3.5 daemon.VMInfos.nbpCPU

Définition à la ligne 244 du fichier daemon.py.

#### 8.5.3.6 tuple daemon.VMInfos.nbpCPU = int() [static]

Définition à la ligne 233 du fichier daemon.py.

#### 8.5.3.7 tuple daemon.VMInfos.pCPUIdleTime = dict() [static]

Définition à la ligne 236 du fichier daemon.py.

#### 8.5.3.8 daemon.VMInfos.pCPUInfos

Définition à la ligne 245 du fichier daemon.py.

#### 8.5.3.9 tuple daemon.VMInfos.pCPUInfos = float() [static]

Définition à la ligne 235 du fichier daemon.py.

#### 8.5.3.10 daemon.VMInfos.VMs

Définition à la ligne 260 du fichier daemon.py.

#### 8.5.3.11 tuple daemon.VMInfos.VMs = list() [static]

Définition à la ligne 232 du fichier daemon.py.

La documentation de cette classe a été générée à partir du fichier suivant :
– daemon.py

# Chapitre 9

# Documentation des fichiers

## 9.1 Référence du fichier daemon.py

### Classes

– class daemon.NetworkCommunication
  *Classe de communication réseau.*

– class daemon.UDPScoketCommunication
  *Classe de communication réseau UDP.*

– class daemon.AbstractInfos
  *Classe de base pour les classes récoltant des informations.*

– class daemon.HostInfos
  *Classe de base pour les classes récoltant des informations.*

– class daemon.VMInfos
  *Classe de base pour les classes récoltant des informations.*

### Paquetages

– package daemon

### Variables

– tuple daemon.hosti = HostInfos()
  *Point d'entrée du logiciel Cette fonction crée les instances des objets et appelle les méthodes infos().*

– tuple daemon.vmi = VMInfos()
– tuple daemon.comm = UDPScoketCommunication()
– tuple daemon.infos = hosti.infos()
– tuple daemon.jsonData = json.dumps(infos)

## 9.2 Référence du fichier mainpage.dox

# Index