

Thématique : 4 L'INFORMATIQUE ET LA PROGRAMMATION (IP)

Compétence - 4.1 Comprendre le fonctionnement d'un réseau informatique

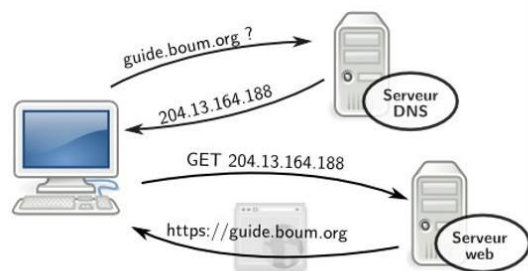
Compétence associée : IP1.1 : Comprendre le fonctionnement d'un réseau informatique

Connaissance : Internet

C'est le **réseau informatique mondial** accessible au public, composé de **millions de réseaux interconnectés**, aussi bien publics que privés. Le web (raccourci de "world wide web", traduit en français par toile mondiale) correspond à une des applications utilisant ce réseau, la principale.

Le **web** est un **système de publication** et de **consultation de documents** (textes, sons, images) faisant appel aux techniques de l'**hypertexte** qui utilisent des renvois permettant de passer directement d'une partie d'un document à un autre, ou d'un document à d'autres documents.

L'information est transmise par **internet** grâce à un ensemble standardisé de protocoles de transfert de données, qui permet l'élaboration d'applications et de services variés.



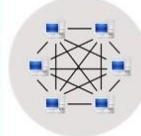
Exemple:

L'ordinateur se connecte au serveur DNS pour connaître l'adresse IP de la page d'accueil d'un site. Il lui envoie une requête qui signifie « envoie-moi la page d'accueil du site web guide.boum.org ». Les paquets qui véhiculent la demande partent et passent alors par la « box » pour arriver au routeur du fournisseur d'accès.

La réponse revient et l'ordinateur peut maintenant s'adresser au serveur Web pour rapatrier la page d'accueil souhaitée.



Le courrier électronique (courriel, e-mail, mail) est un service de transmission de messages écrits et de documents envoyés électroniquement via un réseau informatique dans la boîte aux lettres électronique d'un destinataire choisi par l'émetteur.



Le pair à pair (peer-to-peer, abrégé « P2P ») est un modèle de réseau informatique proche du modèle client-serveur mais où chaque client est aussi un serveur.



Le World Wide Web (WWW), communément appelé le Web, et parfois la Toile, est un système hypertexte public fonctionnant sur Internet. Le Web permet de consulter, avec un navigateur, des pages accessibles sur des sites.

On trouve l'origine d'**internet** dans **Arpanet**, le premier réseau à transfert de paquets de données aux États-Unis en 1972 qui permet l'acheminement de proche en proche de messages découpés en paquets indépendants. L'**internet** est aujourd'hui un **gigantesque réseau composé de millions de réseaux publics et privés**, universitaire, commerciaux, gouvernementaux...

Thématique : 4 L'INFORMATIQUE ET LA PROGRAMMATION (IP)

Compétence - 4.1 Comprendre le fonctionnement d'un réseau informatique

Compétence associée : IP2.3 : Écrire un programme dans lequel des actions sont déclenchées par des événements extérieurs.

Connaissance : Notions d'algorithme et de programme

Les **objets connectés** sont souvent programmés pour fonctionner **automatiquement**. Chaque fonction numérique de l'objet connecté peut être assimilée à un "problème" à résoudre. La **résolution d'un problème** par un programmeur peut s'effectuer en **trois étapes** :

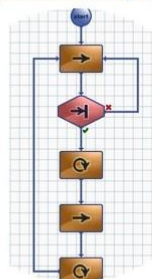
-1- Ecriture d'un algorithme : Suites logique d'opérations ou d'instructions, souvent rédigées sur feuille de papier en utilisant le langage naturel et des mots clés : si, alors, tant que, jusqu'à ...

Exemple : Un robot évitant un obstacle.



- Si le robot détecte un obstacle avec son capteur de pare-choc, alors tourner à gauche de 90°, avancer de 10cm puis tourner à droite de 90°.
- Sinon avancer indéfiniment.

-2- Construction à l'aide d'un logiciel d'une représentation graphique de l'algorithme



Algorithme : organigramme de programmation



Logiciel de représentation graphique par bloc (ou briques) comme Scratch

-3- Traduction de la représentation graphique en langage de programmation qui lui-même sera converti en **langage machine** (code binaire) que le **microprocesseur** peut exécuter

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17 // distance = ultrasonic_3.distanceCm();
18 if (distance < 10) {
19   motor.move(1,0);
20   delay(1000*1);
21   motor.move(4,100);
22   delay(1000*0.45);
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577  motor.move(3,100);
578  delay(1000*0.45);
579  motor.move(1,100);
580  delay(1000*0.6);
581  motor.move(3,100);
582  delay(1000*0.45);
583  motor.move(1,100);
584  delay(1000*0.6);
585  motor.move(3,100);
586  delay(1000*0.45);
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588  delay(1000*0.6);
589  motor.move(3,100);
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593  motor.move(3,100);
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597  motor.move(3,100);
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616  delay(1000*0.6);
617  motor.move(3,100);
618  delay(1000*0.45);
619  motor.move(1,100);
620  delay(1000*0.6);
621  motor.move(3,100);
622  delay(1000*0.45);
623  motor.move(1,100);
624  delay(1000*0.6);
625  motor.move(3,100);
626  delay(1000*0.45);
627  motor.move(1,100);
628  delay(1000*0.6);
629  motor.move(3,100);
630  delay(1000*0.45);
631  motor.move(1,100);
632  delay(1000*0.6);
633  motor.move(3,100);
634  delay(1000*0.45);
635  motor.move(1,100);
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637  motor.move(3,100);
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645  motor.move(3,100);
646  delay(1000*0.45);
647  motor.move(1,100);
648  delay(1000*0.6);
649  motor.move(3,100);
650  delay(1000*0.45);
651  motor.move(1,100);
652  delay(1000*0.6);
653  motor.move(3,100);
654  delay(1000*0
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