

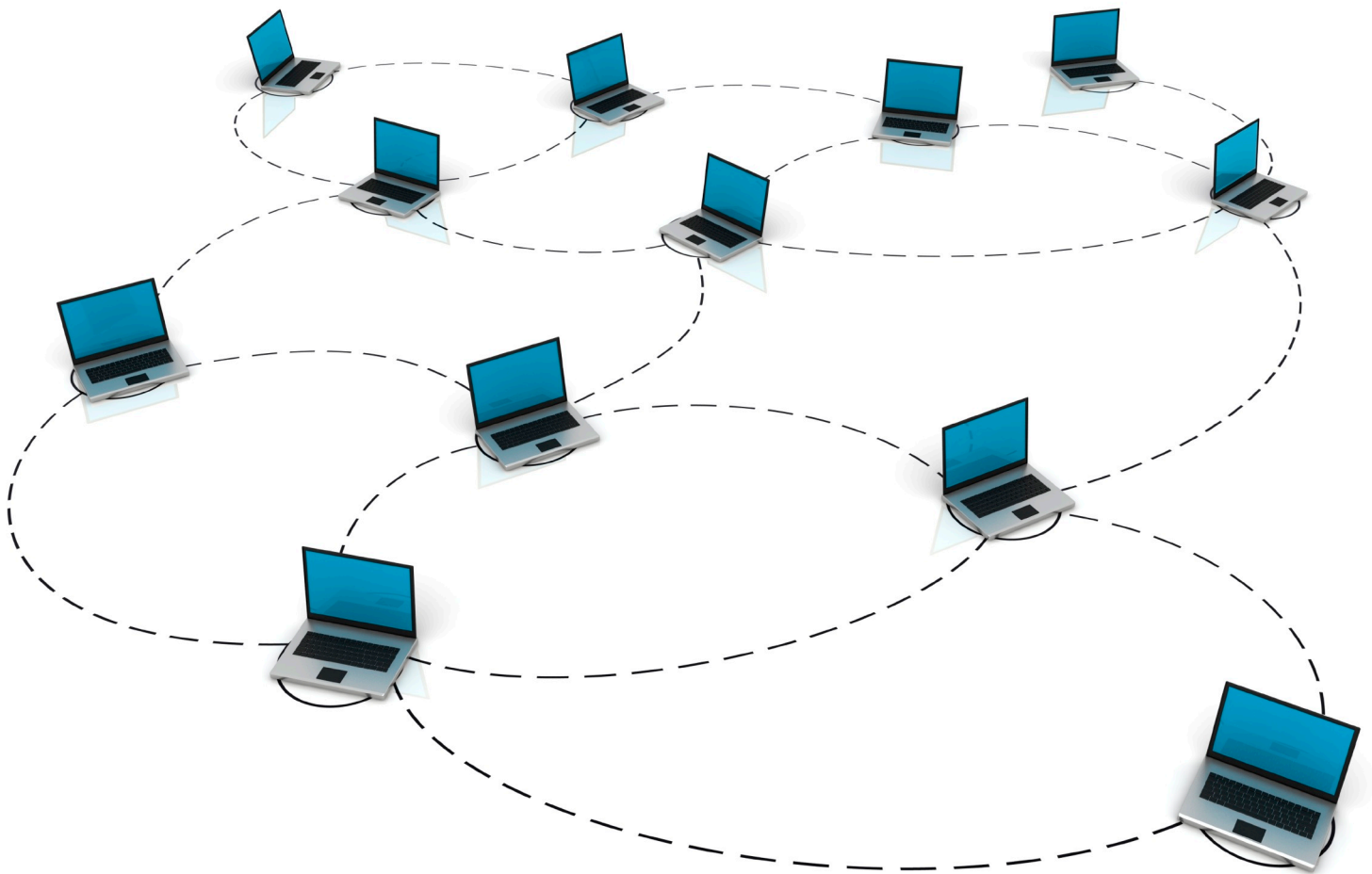
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## Build your own Internet Workbook



# Build your own Internet

Networking is the connecting of several computers, enabling communication and the sharing of data and access to hardware. This workbook is an activity book, supporting the “Build your own Internet” bootcamp.

To begin, you need to form groups of at least 5 people. The reason for this is each participant will be allocated a job title for that group, which they will be playing the role of for the remainder of the workshop.

## 1) A business

In your groups you need to come up with a business concept:

- What will your business be called?
- What will your business be offering a service or a product?
- What will your logo look like?
- What will be your company's USP (Unique Selling Point)?
- How will your company promote itself and to more business?

There are also additional factors to consider such as whether the company will be eco-friendly or what would the business offer in regards to the local community?



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The roles to choose from are as follows:

Job	Description
Group Leader	Coordinating the work of group members, helping other to complete their tasks and relaying information or feedback to the workshop manager when appropriate.
Hardware Technician	Collecting paperwork and other materials during group work and assisting the group by making sure the equipment used in the activities are properly set up.
Software Technician	Inputting computer data when necessary and assisting group members using HTML software when problems arise.
Graphic Designer	Directing the logo and team shield activities (group leader supports this role), taking key role in developing graphics during relevant activities and coordinating and implementing group ideas during activities that require graphics.
Product Designer	Leading the product development activity (group leader supports this role).

## 2) Roles

Using the table above, decide which roles you wish to follow for the remainder of the workshop. If you have a group of more than 5, roles can either be duplicated or between your group you can decide on more roles you feel will assist you during this process.

Now that you and your group have decided upon what your business is and your individual roles, next thing your business needs to consider is the website. The website is to promote your business and the specific service or product(s) your business offers.

## 3) Designing the website

In your group, led by the graphic designer and overseen by the group leader, design a concept for your business' website. How will you lay it out? What about the logo?

Careful consideration of imagery and content is particularly key. Both need to be kept professional and sensible, not to mention consistent for a professional look on the website. Remember to keep in mind who your target audience is throughout this process.

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A document that will assist you within the next task is available alongside this resource pack. The Cheat Sheet contains a variety of HTML tags that can be used during the implementation and development of your website.

## 4) Implementation

Create your website using HTML. This is to be kept at a basic level and led by the Software Technician of the group. Each member of the group is to work together during this stage to build up a website, however the Software Technician is to oversee all code. The Software Technician is to ensure the Group Leader and Graphics designer are both happy with the appearance and content of the website.

Some example tags from the Cheat Sheet are below:

### <Head>

This defines the head of the HTML document, many tags are designed to be embedded within this tag.

### <Title>

Each <Head> tag should contain this tag, defining the title of the HTML document you are working on. This is normally displayed at the top of the browser as it is embedded within <Head>.

### <Body>

This tag is used to define the document's body, the body contains all other elements of the HTML page. This includes text, paragraphs and images.

### <P>

This tag defines paragraphs within a document. Normally browsers will automatically add in a space (margin) between each paragraph and its parent element. This can be defined using CSS - Cascading Style Sheets which aid consistent formatting across numerous HTML documents.

### <Header>

This tag is used to specify a header for a section or the document. For pre-defined header types, you could alternatively use <h1>, <h2>, <h3>, <h4>, <h5> or <h6> for a varied range of pre-defined header sizes (<h1> is the biggest). These are usually used for importance of the headers (h1 is most important, h6 is the least).

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You will need a shower curtain ring and pieces of string. The string needs to be tied around the shower curtain ring, so it looks similar to a spider, with 4 or more legs coming from it.

## 5) Network Activity

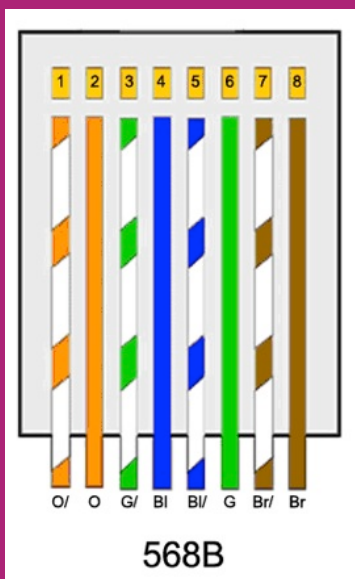
Each of you need to hold an end of the string, attached to the curtain rail. What do you notice about what happens when one of you pulls on your end of the string? Discuss how this resembles when computers are networked together.

Next you are going to assemble your own Network Cable, you will be supplied the following:

- Length of Cable
- Wire Stripper
- Connector
- Crimping Tool
- Modular Plug
- Cable Tester

## 6) Network Cable

- Measure the cable to length, add about 6 inches extra and cut the wire. It is good to have a little extra in case you make an error in crimping the end and have to re-do the wire.



- Strip approximately 3/4 inch of the cable jacket from the end of the cable using the cable stripper.
- Sort the wire pairs so that they fit into the connector and organise the wire in the proper order (see image on the left).
- Clip the wires so they are even.
- Insert the wires onto the RJ-45 Modular Plug as shown on the left. Push the wires into the connector until the ends of each wire can be seen through the clear end of the connector.
- Now is the time to verify that the wire order is correct. The wires are visible through the plastic connector.

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## 6) Network Cable continued

- A Crimping tool is used to crimp the wires onto the RJ-45 plug. Squeeze the handle on the crimping tool all the way until it clicks and releases. This step crimps the wire onto the insulation displacement connector pins on the RJ-45 jack to the twisted pair of wires.
- Once this has been done, you need to test your cable using one of the cable testers.
- If all of the lights flash simultaneously (as in 1 flash when 1 does, 2 when 2 does and so on) then you have a working cable, if it doesn't then you need to check your wiring in the cable as some of it may have come loose or been wired wrong etc.

The next task uses a tool called "PING" which stands for "Packet Internet or Inter-Network Groper". Let's do an activity first to understand how "PING" works.

## 7) PING - game

In your groups, choose who will be a hub, who will be a router and the others will each be a terminal for this task. Your group will need a variety of ping pong balls.

One terminal must pass a ping pong ball to the hub to the router and to another terminal. To check this terminal successfully received the message, the ping pong ball must be passed back to the router, to the hub and then to the originating terminal.

This can be replicated for several terminals.

## 8) PING

Open up your command prompt on your Windows computer, use some of the following parameters to test whether a host is reachable across an IP network. It is used to check for network errors.

Extracted from the Microsoft.com Product Documentation:

```
ping [-t] [-a] [-n Count] [-l Size] [-f] [-i TTL]
      [-v TOS] [-r Count] [-s Count] [{-j HostList| -k
      HostList}] [-w Timeout] [TargetName]
```



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Parameter	Description
-t	Specifies that ping continue sending Echo Request messages to the destination until interrupted.
-a	Specifies that reverse name resolution is performed on the destination IP address. If this is successful, ping displays the corresponding host name.
-n Count	Specifies the number of Echo Request messages sent. The default is 4.
-l Size	Specifies the length, in bytes, of the Data field in the Echo Request messages sent. The default is 32.
-f	Specifies that Echo Request messages are sent with the Don't Fragment flag in the IP header set to 1. The Echo Request message cannot be fragmented by routers in the path to the destination.
-i TTL	Specifies the value of the TTL field in the IP header for Echo Request messages sent. The default is the default TTL value for the host. For Windows XP hosts, this is typically 128.
-v TOS	Specifies the value of the Type of Service (TOS) field in the IP header for Echo Request messages sent. The default is 0. TOS is specified as a decimal value from 0 to 255.
-r Count	Specifies that the Record Route option in the IP header is used to record the path taken by the Echo Request message and corresponding Echo Reply message. Each hop in the path uses an entry in the Record Route option. If possible, specify a Count that is equal to or greater than the number of hops between the source and destination. The Count must be a minimum of 1 and a maximum of 9.
-s Count	Specifies that the Internet Timestamp option in the IP header is used to record the time of arrival for the Echo Request message and corresponding Echo Reply message for each hop. The Count must be a minimum of 1 and a maximum of 4.
-j HostList	Specifies that the Echo Request messages use the Loose Source Route option in the IP header with the set of intermediate destinations specified in HostList. The maximum number of addresses or names in the host list is 9. The host list is a series of IP addresses (in dotted decimal notation) separated by spaces.
-k HostList	Specifies that the Echo Request messages use the Strict Source Route option in the IP header with the set of intermediate destinations specified in HostList. The maximum number of addresses or names in the host list is 9. The host list is a series of IP addresses (in dotted decimal notation) separated by spaces.
-w Timeout	Specifies the amount of time, in milliseconds, to wait for the Echo Reply message that corresponds to a given Echo Request message to be received. If the Echo Reply message is not received within the time-out, the "Request timed out" error message is displayed. The default time-out is 4000 (4 seconds).
TargetName	Specifies the destination, which is identified either by IP address or host name.
/?	Displays help at the command prompt.

# Build your own Internet

Now that you have some basic components ready and a website created ready to go online the next to consider is getting your website hosting online. You need to fill in the form on the following page, that is an application for Domain Name for your website. A domain name is a unique name given to your website, rather than using IP addresses to find the location of your website.

## 9) Numbers

- Everybody is to write down 6 telephone numbers they know.
- You will be given 6 other numbers, of the same length.
- You have 3 minutes to try and remember as much as you can!

## 10) Letters

- Write down 6 names.
- You will be given 6 more names to remember.
- You have 3 minutes to try and remember as much as you can.

What do you notice?

The workshop assistants at this stage will guide you through linking your routers to the switch.

On the following page is the final task, this task request each group to evaluate other group's websites. The form on the following page must be completed and duplicate copies can be printed to evaluate each individual group - remember any criticisms must be kept constructive.



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Name:	
Members of the group:	
Domain Name and indication of purpose:	
Appearance and organisation:	
Content:	
Purpose:	
Usability:	



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