# Virtual Server and DDNS

# For BIPAC 741/743GE

**August, 2003**

# Port Number

In TCP/IP and UDP networks, a port is a 16-bit number, used by the host-to-host protocol to identify to which application program it must deliver incoming messages. Some ports have numbers that are pre-assigned to them by the IANA, and these are known as well-known ports. Servers follow the well-know port assignments so clients can locate them.

The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. Port numbers range from 0 to 65536, but only port numbers 0 to 1024 are reserved for privileged services and designated as well-known ports. The registered ports are numbered from 1024 through 49151. The remaining ports, referred to as dynamic ports or private ports are numbered from 49152 through 65535.

Examples of well-known and registered port numbers are as below. For further information, please see the IANA web, http://www.iana.org/assignments/port-numbers.

| **Port Number** | **Protocol** | **Description** |
|---|---|---|
| 1 | ICMP | PING |
| 20 | TCP | FTP Data |
| 21 | TCP | FTP Control |
| 22 | TCP & UDP | SSH Remote Login Protocol |
| 23 | TCP | Telnet |
| 25 | TCP | SMTP (Simple Mail Transfer Protocol) |
| 53 | TCP & UDP | DNS (Domain Name Server) |
| 69 | UDP | TFTP (Trivial File Transfer Protocol) |
| 80 | TCP | World Wide Web HTTP |
| 110 | TCP | POP3 (Post Office Protocol Version 3) |
| 119 | TCP | NEWS (Network News Transfer Protocol) |
| 123 | UDP | NTP (Network Time Protocol) |
| 161 | TCP | SNMP |
| 443 | TCP & UDP | HTTPS |
| 1503 | TCP | T.120 |
| 1720 | TCP | H.323 |
| 4000 | TCP | ICQ |
| 7070 | UDP | RealAudio |

# Virtual Server (Port Forwarding)

Users can specify some services to be visible from outside users. The router can detect incoming service requests and forward it to the specific local computer to handle it. For example, users can assign a PC in a LAN acting as a Web server inside and expose it to the outside network.

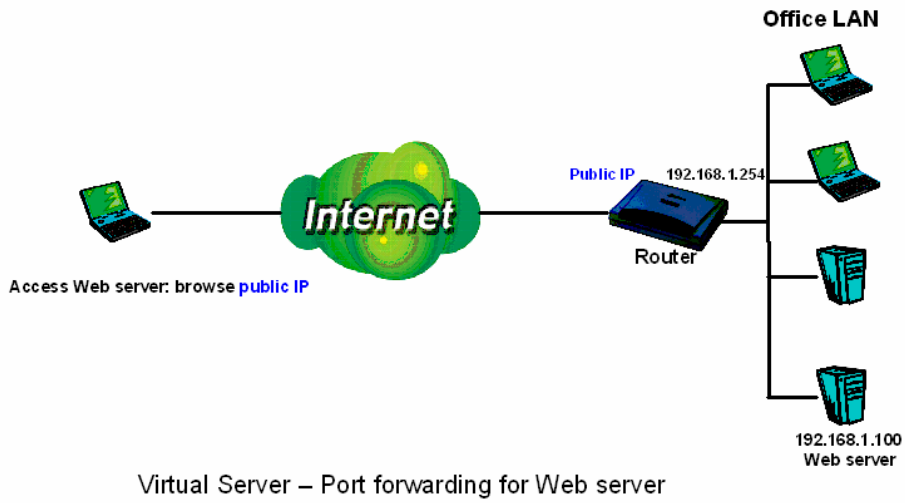
You can set up a local server by specifying the application, which is the combination of transmission protocol (either TCP or UDP) & port number, and the IP address of the local host computer. When an incoming access request to the router for a specified application (protocol & port number) is received, it will be forwarded to the corresponding internal server.

## An Example of Configuring a Web Server on the Local Network

To save time to configure, this router has listed the well-known protocol and port numbers that are used for the most popular applications on the Virtual Server table, e.g. Web (TCP/80), FTP (TCP/21), Telnet (TCP/23), SMTP (TCP/25), POP3 (TCP/110), IKE (UDP/500), etc. This is an example to configure a Web server, just check Enable, and input the IP address of the Web server.

**Background of the Example**
Setup the Web server in the office that can be visible to the outside network.

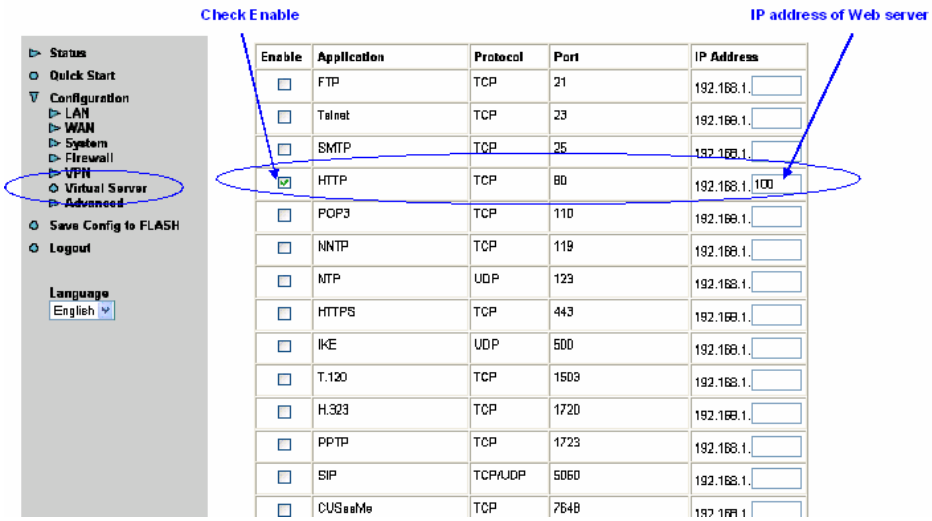
**Application Diagram**




Virtual Server – Port forwarding for Web server

**Configuring a Virtual Server**

1. Set Web server IP address to a fixed IP = 192.168.1.100
2. Configure the Virtual Server

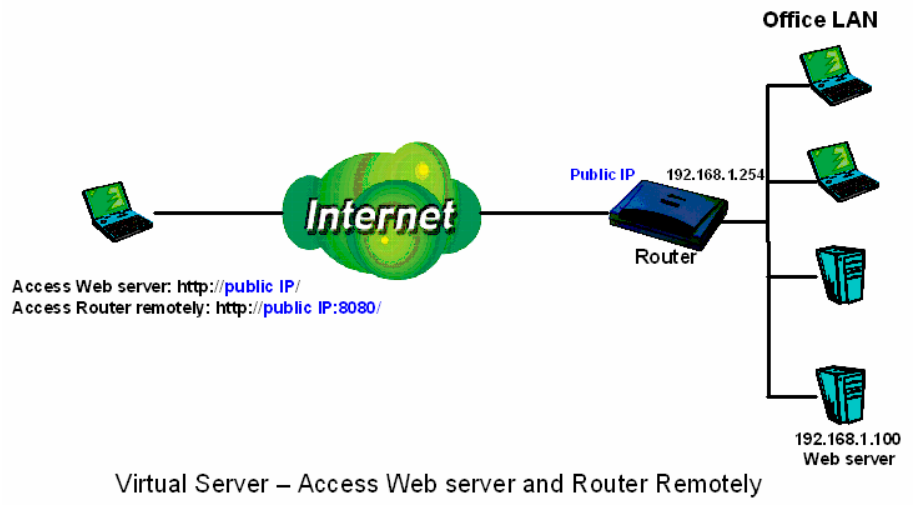



## An example of configuring the Web Server & the Router to be accessible remotely

### Background of the Example

Setup the Web server in the office that can be visible to the outside network. In the meantime, set the router to be accessible remotely through HTTP. Since they use the same protocol (TCP), we have to change the port number of either application to make these two services available. Please note the access method to the Web server and router is different in case 1 & 2, this is particularly related to port number settings. Refer below for details.

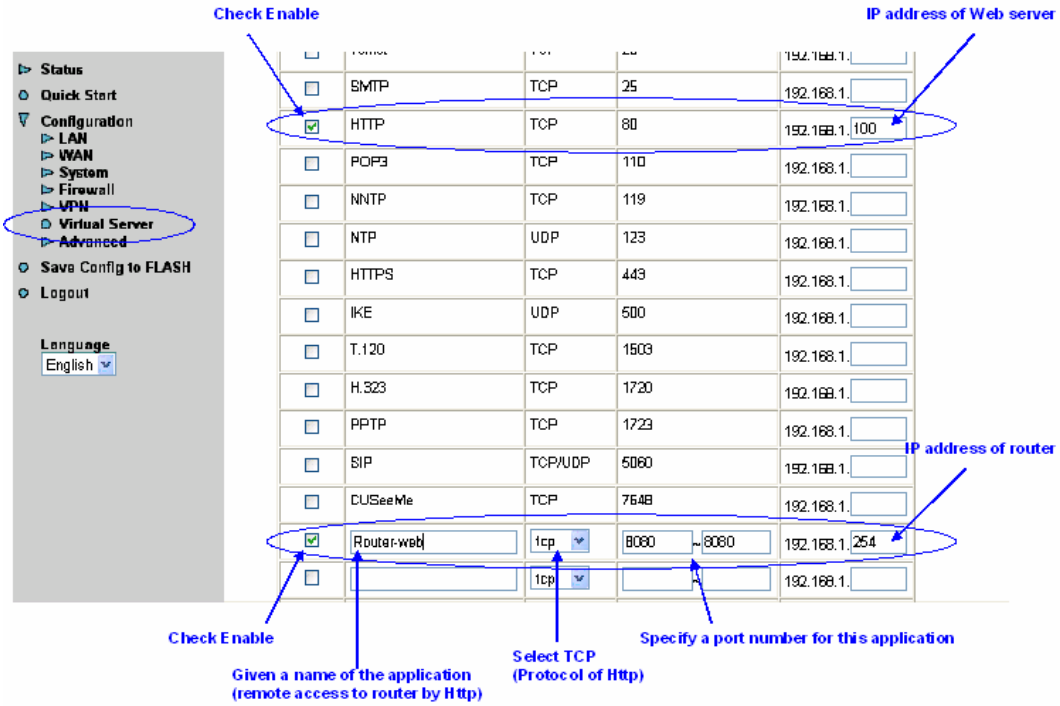
### Example 1: Application Diagram



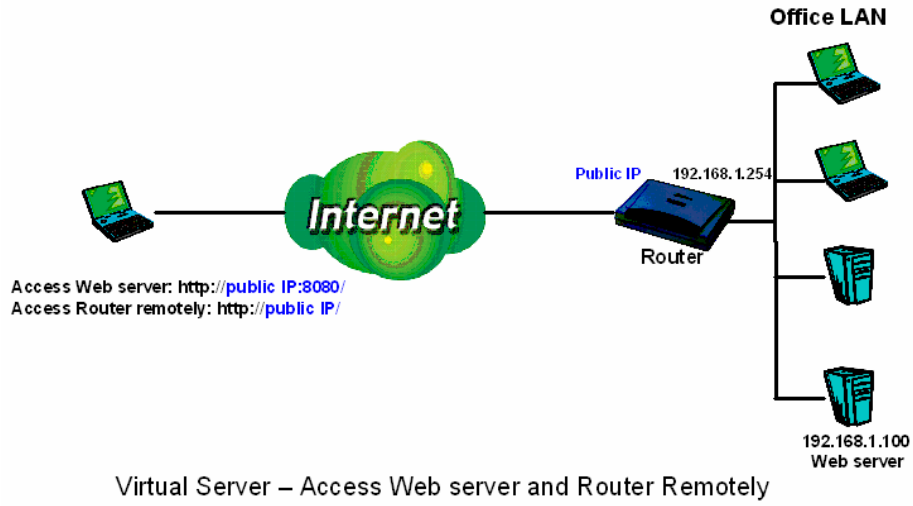

Virtual Server – Access Web server and Router Remotely

### Example 1: Configuring a Virtual Server

1. Set Web server IP address to a fixed IP (this is the IP of the PC running your web server software, e.g. 192.168.1.100)
2. Configure the Virtual Server



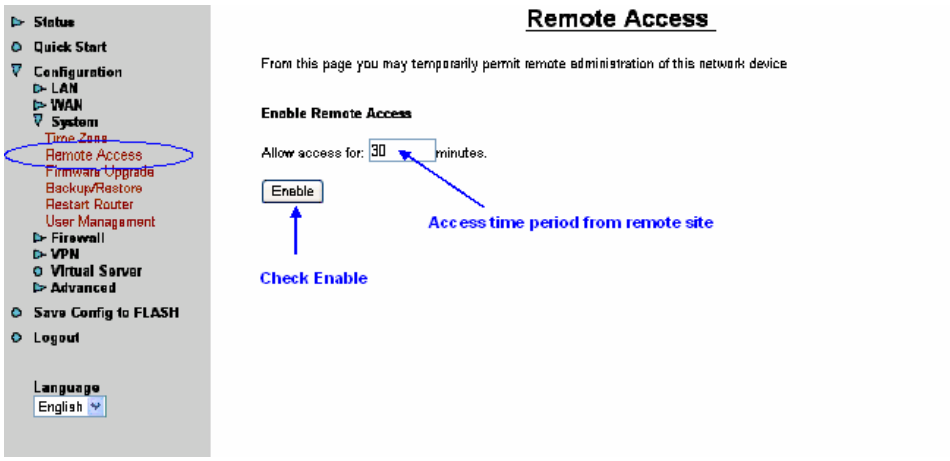

## Example 2: Application Diagram



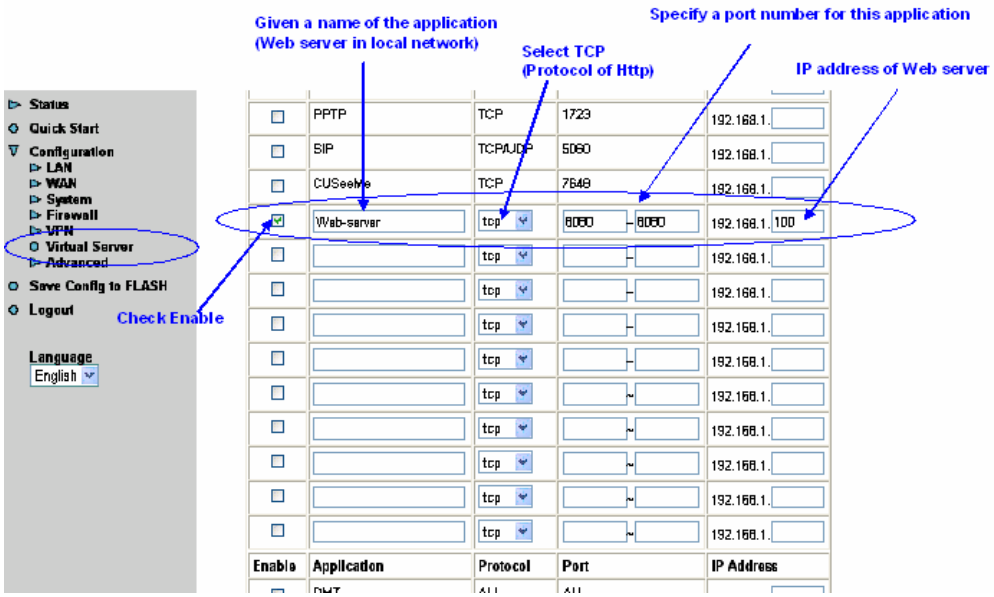

Virtual Server – Access Web server and Router Remotely

## Example 2: Configuring a Virtual Server

1. Set Web server IP address to a fixed IP = 192.168.1.100
2. Set Remote Access as Enable. User can access the router remotely through port 80.




3. Since the port number 80 is used by the router, the Web server port number needs to be changed.




# Dynamic Domain Name Server

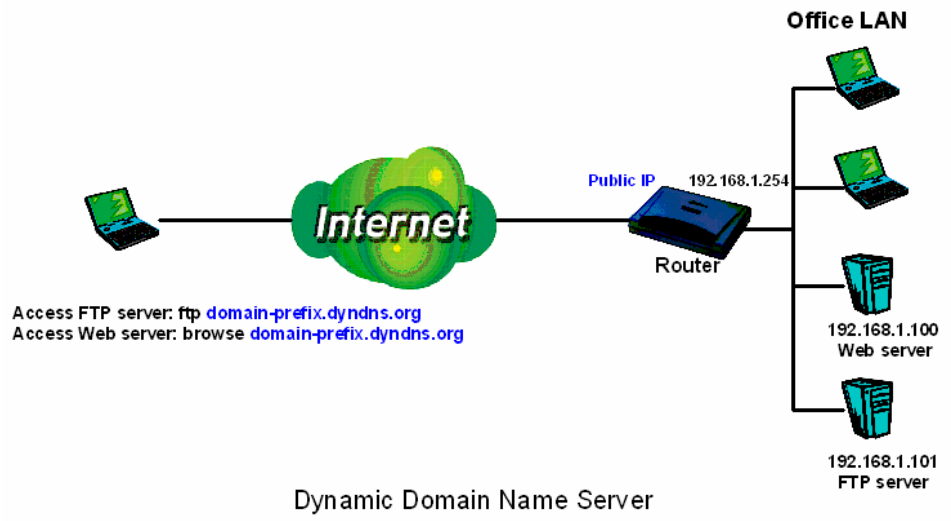
Powered by Dynamic Domain Name System (DDNS), you can even set up a Web/FTP/Email server at home or in the office, and the server can be accessed by the domain name, not the annoying dynamic IP address. DDNS will tie a domain name (e.g. example.com, or user.dyndns.org) to your dynamic IP address.

## An Example of Configuring DDNS

### Background of the Example

Setup a Web server in the office that can be accessed via Domain Name instead of dynamic IP address.

### Application Diagram




## Configuring DDNS

1. Set the Web server and FTP server IP address as described in section **Virtual Server**.
2. Apply for an account from this free Web server http://www.dyndns.org/. There are more than 5 DDNS services supported by this router.
3. Configure DDNS