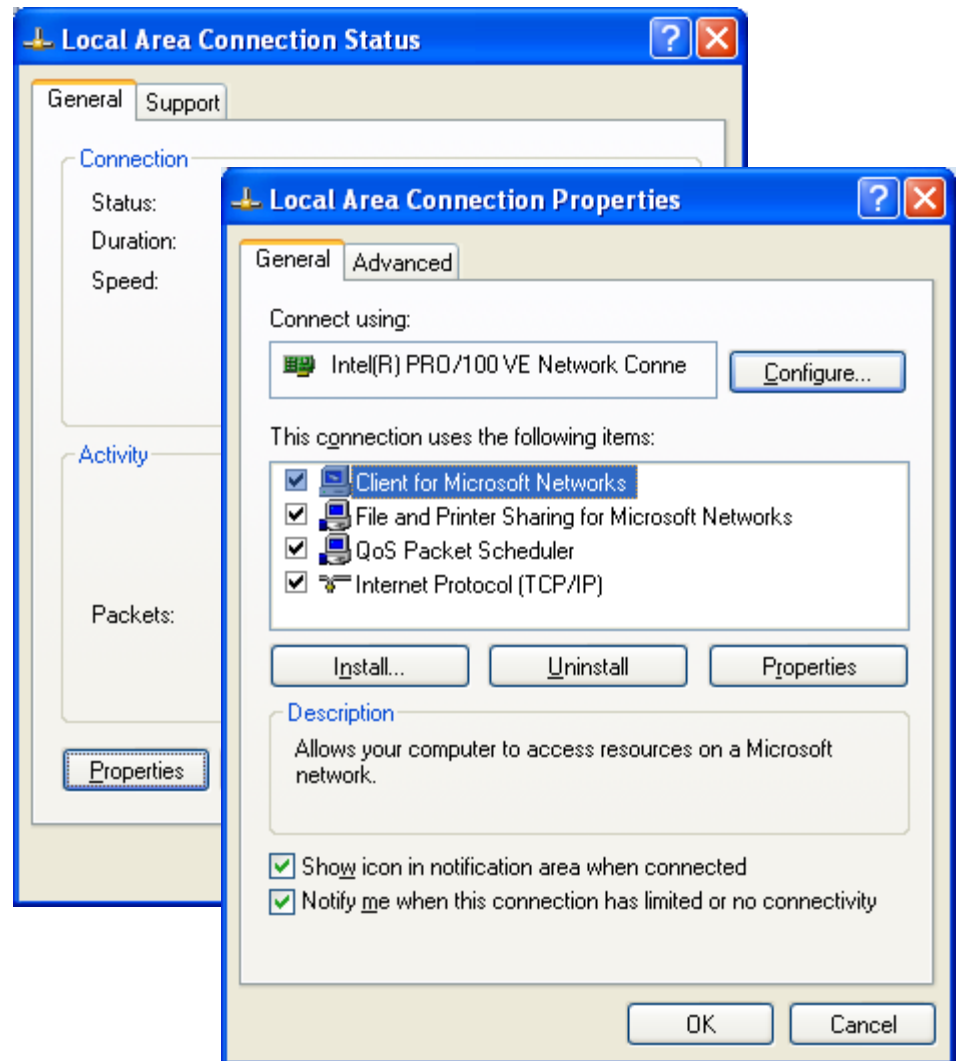
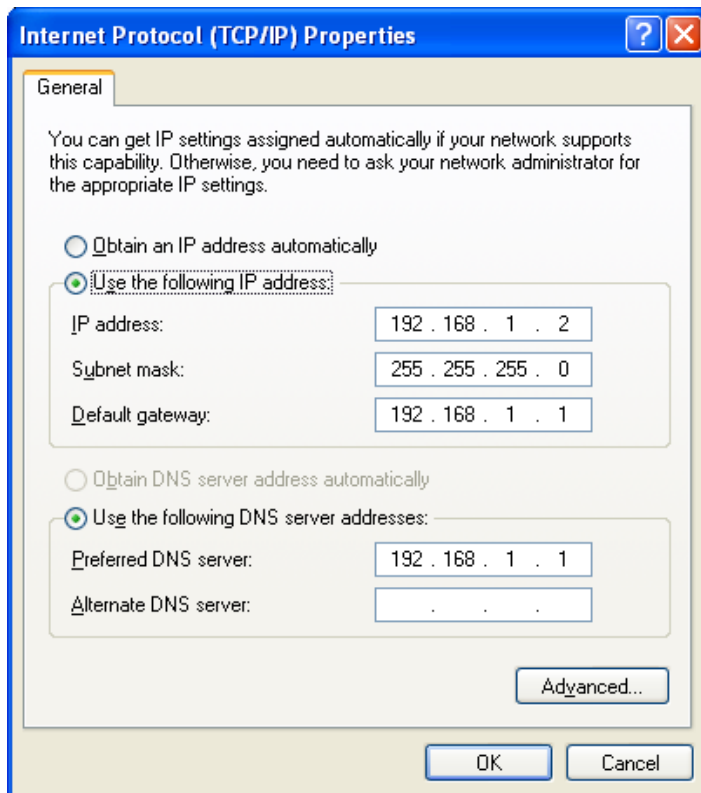


Programming a Linksys E3000 Router

September 6, 2010

Joining the E3000 Network

We connect from our computer to the Linksys E3000 router with a regular patch cable and put the Network Interface Card on the 192.168.1..X network as shown.



Username and Password

We open our network browser, and type 192.168.1.1 to access the Linksys E3000 router. A connect to 192.168.1.1 window will appear and to gain admittance to the router, the Linksys manual has a blank username and the default password is *admin*.



The Cisco Router Setup Screen

To program the E3000 router, we begin with the Basic Setup window.

The screenshot shows the Cisco Router Basic Setup interface in a Windows Internet Explorer browser window. The browser title is "Basic Setup - Windows Internet Explorer" and the address bar shows "http://192.168.1.1/". The page features the Cisco logo and "Firmware Version: 1.0.01". The main navigation bar includes "Setup", "Wireless", "Security", "Storage", "Access Restrictions", "Applications & Gaming", "Administration", and "Status". The "Setup" section is active, with sub-tabs for "Basic Setup", "DDNS", "MAC Address Clone", and "Advanced Routing". The "Basic Setup" sub-tab is selected, showing the following configuration options:

- Language:** Select your language (English)
- Internet Setup:** Internet Connection Type (Automatic Configuration - DHCP)
- Optional Settings (required by some Internet Service Providers):**
 - Host Name: []
 - Domain Name: []
 - MTU: Auto (Size: 1500)
- Network Setup:** Router Address
 - IP Address: 192 . 168 . 1 . 1
 - Subnet Mask: 255.255.255.0
 - Device Name: Cisco02027

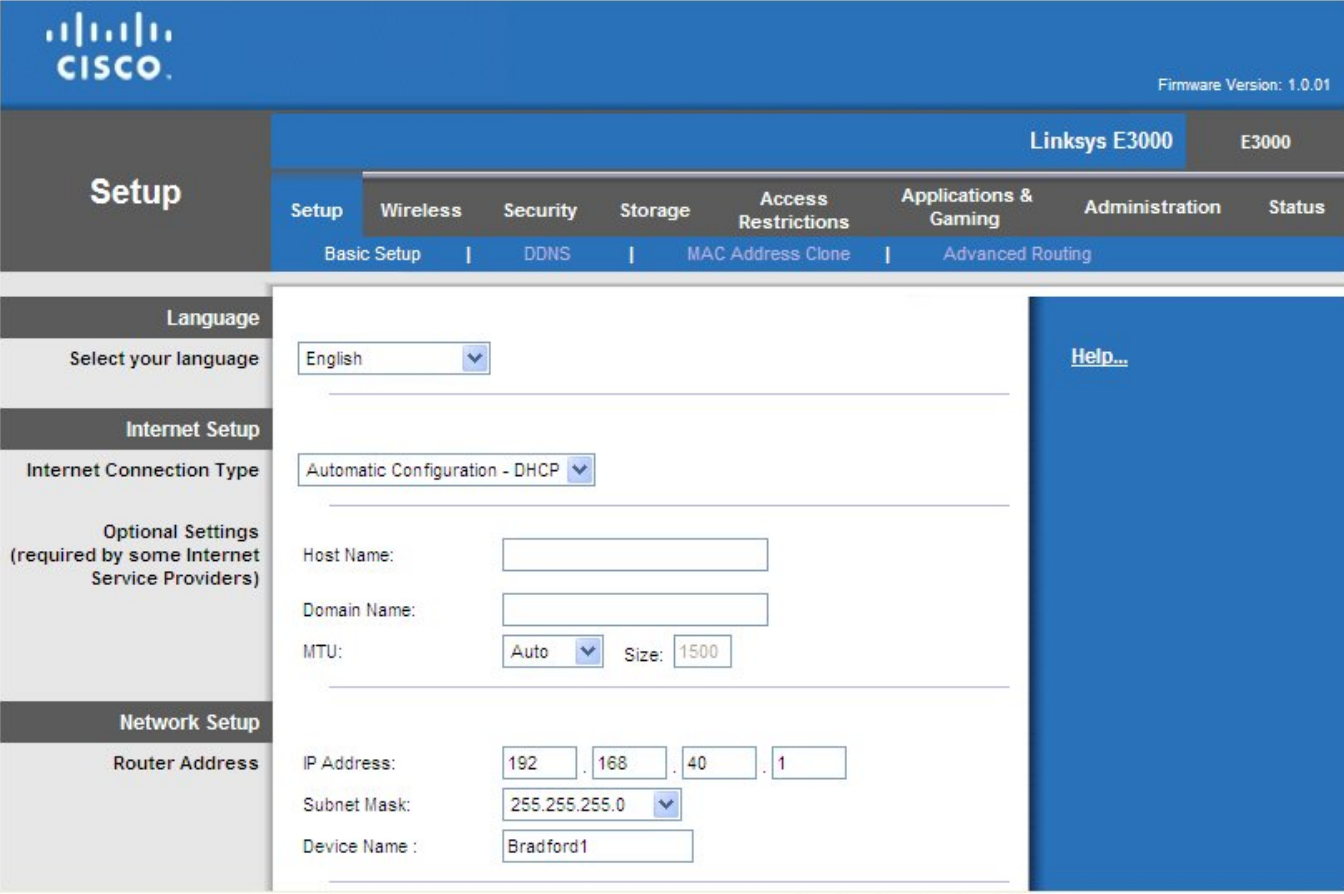
A "Help..." link is visible on the right side of the page. The browser's taskbar at the bottom shows the "Internet" icon and a 100% zoom level.

Change the Router's Address

We next will place the router on the programmed network address.

We will use 192.168.40.1. The subnet mask is 255.255.255.0.

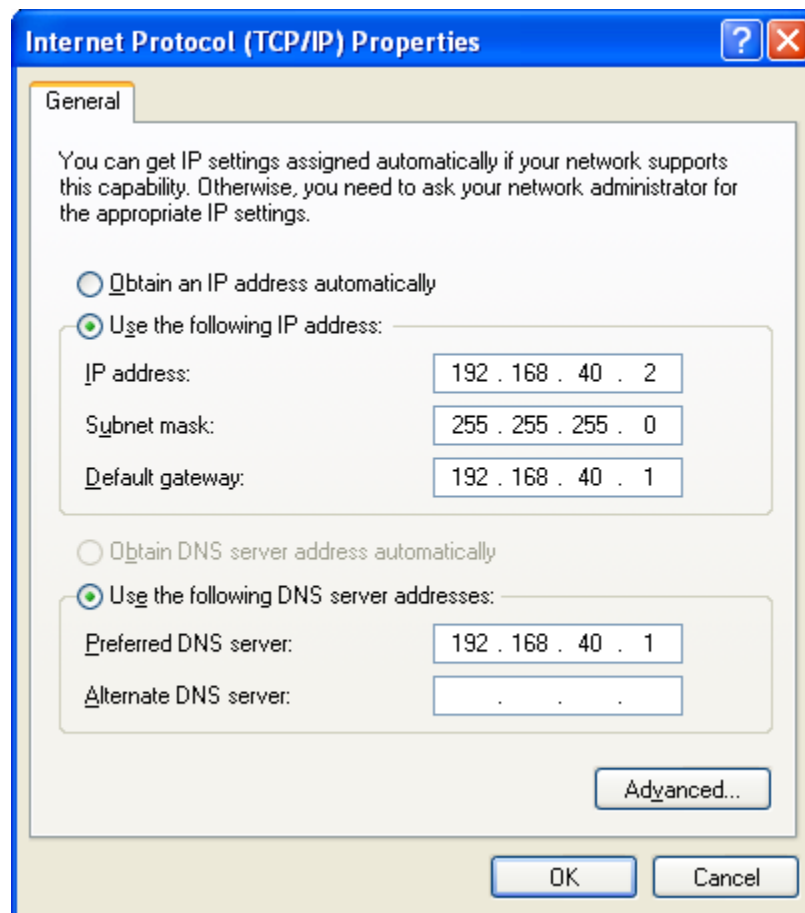
We call the device Bradford1. We go to the bottom of the page and save the setting.



The screenshot displays the Cisco Linksys E3000 router's web interface. The top navigation bar includes the Cisco logo and the model name 'Linksys E3000' with 'E3000' in a smaller box. The 'Firmware Version: 1.0.01' is also visible. The main navigation menu is divided into 'Setup' (selected) and other sections: 'Wireless', 'Security', 'Storage', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. Under 'Setup', there are sub-menus: 'Basic Setup', 'DDNS', 'MAC Address Clone', and 'Advanced Routing'. The left sidebar contains a 'Setup' menu with categories: 'Language', 'Internet Setup', 'Optional Settings (required by some Internet Service Providers)', and 'Network Setup'. The 'Network Setup' category is expanded to show 'Router Address'. The main content area shows the configuration for the Router Address. The 'Language' is set to 'English'. The 'Internet Connection Type' is 'Automatic Configuration - DHCP'. The 'Host Name' and 'Domain Name' fields are empty. The 'MTU' is set to 'Auto' and the 'Size' is '1500'. The 'IP Address' is set to '192.168.40.1'. The 'Subnet Mask' is set to '255.255.255.0'. The 'Device Name' is set to 'Bradford1'. A 'Help...' link is visible on the right side of the page.

Change the Computer's IP Address

To rejoin the router and continue to program the unit, we now change our computer's IP address to 192.168.40.2 and make our gateway address to the router as 192.168.40.1.



Setting the DHCP Settings

Our router will distribute network IP addresses to client computers using Dynamic Configuration Control Protocol (DHCP). We will make 250 addresses available. We will change the router to the Eastern time zone. We will save our settings.

The screenshot shows the DHCP Server Setting page of a router. The left sidebar contains the following menu items: Network Setup, Router Address, DHCP Server Setting (selected), Time Settings, and Reboot. The main content area is divided into sections:

- Network Setup:** MTU: Auto (dropdown), Size: 1500
- Router Address:** IP Address: 192 . 168 . 40 . 1; Subnet Mask: 255,255,255,0 (dropdown); Device Name: Bradford1
- DHCP Server Setting:** DHCP Server: Enabled Disabled ; Start IP Address: 192 . 168 . 40 . 2; Maximum Number of Users: 250; IP Address Range: 192 . 168 . 40 . 2 to 251; Client Lease Time: 0 minutes (0 means one day); Static DNS 1: 0 . 0 . 0 . 0; Static DNS 2: 0 . 0 . 0 . 0; Static DNS 3: 0 . 0 . 0 . 0; WINS: 0 . 0 . 0 . 0
- Time Settings:** Time Zone: (GMT-05:00) Eastern Time (USA & Canada) (dropdown); Automatically adjust clock for daylight saving changes.
- Reboot:**

At the bottom of the page, there are two buttons: and .

Set the Wireless Settings

The Linksys E3000 router can run 2.4 and 5 GHz at the same time. We will set them both as mixed mode, BradfordWireless1 for the SSID, and both channels will broadcast. We will save the settings at the bottom of the page.

The screenshot shows the Linksys E3000 router's configuration interface. The top navigation bar includes the Cisco logo, the model name 'Linksys E3000', and the firmware version '1.0.01'. The main navigation menu is divided into 'Wireless', 'Setup', 'Security', 'Storage', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. The 'Wireless' section is active, and the 'Basic Wireless Settings' sub-tab is selected. The interface is split into two main sections: '5GHz Wireless Settings' and '2.4GHz Wireless Settings'. Both sections are set to 'Manual' mode. The 5GHz settings are configured with 'Mixed' network mode, 'BradfordWireless1' SSID, 'Auto(20MHz or 40MHz)' channel width, 'Auto (DFS)' channel, and 'Enabled' SSID broadcast. The 2.4GHz settings are configured with 'Mixed' network mode, 'BradfordWireless1' SSID, '20MHz only' channel width, '1 - 2.412GHZ' channel, and 'Enabled' SSID broadcast. A 'Help...' link is visible on the right side of the page.

Security Settings

We will leave the security settings alone.

The screenshot shows the Cisco Linksys E3000 web interface. The top navigation bar includes the Cisco logo, the model name 'Linksys E3000', and the firmware version '1.0.01'. The main navigation menu is divided into 'Security' (selected) and other sections: Setup, Wireless, Storage, Access Restrictions, Applications & Gaming, Administration, and Status. Under the 'Security' section, 'Firewall' and 'VPN Passthrough' are visible. The left sidebar contains 'Firewall', 'Internet Filter', and 'Web Filter'. The main content area shows 'SPI Firewall Protection' set to 'Enabled'. Below this, there are four checked options: 'Filter Anonymous Internet Requests', 'Filter IDENT (Port 113)', 'Proxy', 'Java', 'ActiveX', and 'Cookies'. At the bottom right, there are 'Save Settings' and 'Cancel Changes' buttons. A 'Help...' link is also present on the right side.

CISCO

Firmware Version: 1.0.01

Linksys E3000 E3000

Security

Setup Wireless Security Storage Access Restrictions Applications & Gaming Administration Status

Firewall | VPN Passthrough

Firewall

Internet Filter

Web Filter

SPI Firewall Protection: Enabled Disabled

Filter Anonymous Internet Requests

Filter Multicast

Filter Internet NAT Redirection

Filter IDENT (Port 113)

Proxy Java ActiveX Cookies

Help...

Save Settings Cancel Changes

Wireless Security Settings

We will make the security mode for both the 2.4 and 5 GHz signal WPA2 Personal with a password called “graduate”. We then save the settings.

The screenshot displays the Cisco Linksys E3000 wireless security configuration interface. The top navigation bar includes the Cisco logo, the device name 'Linksys E3000', and the firmware version '1.0.01'. The main navigation menu is divided into 'Wireless' and 'Security' sections. Under 'Wireless', there are sub-menus for 'Setup', 'Wireless', 'Security', 'Storage', 'Access Restrictions', 'Applications & Gaming', 'Administration', and 'Status'. The 'Wireless' sub-menu is further divided into 'Basic Wireless Settings', 'Wireless Security', 'Wireless MAC Filter', and 'Advanced Wireless Settings'. The 'Wireless Security' sub-menu is currently selected, showing settings for both 5GHz and 2.4GHz wireless networks. For each band, the 'Security Mode' is set to 'WPA2 Personal' and the 'Passphrase' is 'graduate'. A 'Help...' link is visible on the right side of the page. At the bottom, there are 'Save Settings' and 'Cancel Changes' buttons.

Band	Security Mode	Passphrase
5GHz Wireless Security	WPA2 Personal	graduate
2.4GHz Wireless Security	WPA2 Personal	graduate

Network Blocking

We will go Access Restriction on the Menu bar and on that page we will create a policy named FTP. In the blocked applications, we choose FTP (port 21) and using the right arrow send it to the blocked list. We save the settings.

Internet Access Policy

Access Blocking Policy: 1 () [Delete This Entry](#) [Summary](#)

Enter Policy Name:

Status: Enabled Disabled

[Edit List](#) (This Policy applies only to PCs on the List.)

Deny Internet access during selected days and hours.
 Allow

Days: Everyday Sun Mon Tue Wed Thu Fri Sat

Times: 24 Hours 12 AM : 00 to 12 AM : 00

URL 1: URL 3:
URL 2: URL 4:

Keyword 1: Keyword 3:
Keyword 2: Keyword 4:

Note: only ten applications can be blocked per policy.

Applications	Blocked List
DNS (53 - 53)	FTP (21 - 21)
Ping (0 - 0)	
HTTP (80 - 80)	
HTTPS (443 - 443)	
POP3 (110 - 110)	
IMAP (143 - 143)	
SMTP (25 - 25)	

Application Name	FTP
Port Range	21 to 21
Protocol	TCP

[Add](#) [Modify](#) [Delete](#)

[Help...](#)

Blocking WOW

We will create another policy to block a game called World of Warcraft. We create three application names, WOW1, WOW2 and WOW3. In the first, we make the port range 3724 to 3724. In the second, we the port range is 6112 to 6112. In the third, we make the port range 6881 to 6999. All three applications are move to the blocked list and we save the settings.

The screenshot shows a web-based configuration interface for blocking applications. On the left is a sidebar with three sections: 'Schedule', 'Website Blocking by URL Address', and 'Website Blocking by Keyword'. The main area is titled 'Blocked Applications' and contains the following elements:

- Schedule:** Days: Everyday, Sun, Mon, Tue, Wed, Thu, Fri, Sat. Times: 24 Hours, 12 AM : 00 to 12 AM : 00.
- Website Blocking by URL Address:** Four input fields for URL 1, URL 2, URL 3, and URL 4.
- Website Blocking by Keyword:** Four input fields for Keyword 1, Keyword 2, Keyword 3, and Keyword 4.
- Note:** only ten applications can be blocked per policy.
- Applications List:** A list of applications with their port ranges: DNS (53 - 53), Ping (0 - 0), HTTP (80 - 80), HTTPS (443 - 443), POP3 (110 - 110), IMAP (143 - 143), SMTP (25 - 25). Navigation buttons '>>' and '<<' are present.
- Blocked List:** A list of blocked applications: wow1 (3724 - 3724), wow2 (6112 - 6112), wow3 (6881 - 6999).
- Form:** Application Name: wow3; Port Range: 6881 to 6999; Protocol: Both.
- Buttons:** Add, Modify, Delete.
- Footer:** Save Settings, Cancel Changes.

Administrative Password

To protect our router's settings from improper changes, we add a smart password that has upper and lower case letters, numbers and special characters. Only network administrators will know the password. We save the settings at the bottom of the page.

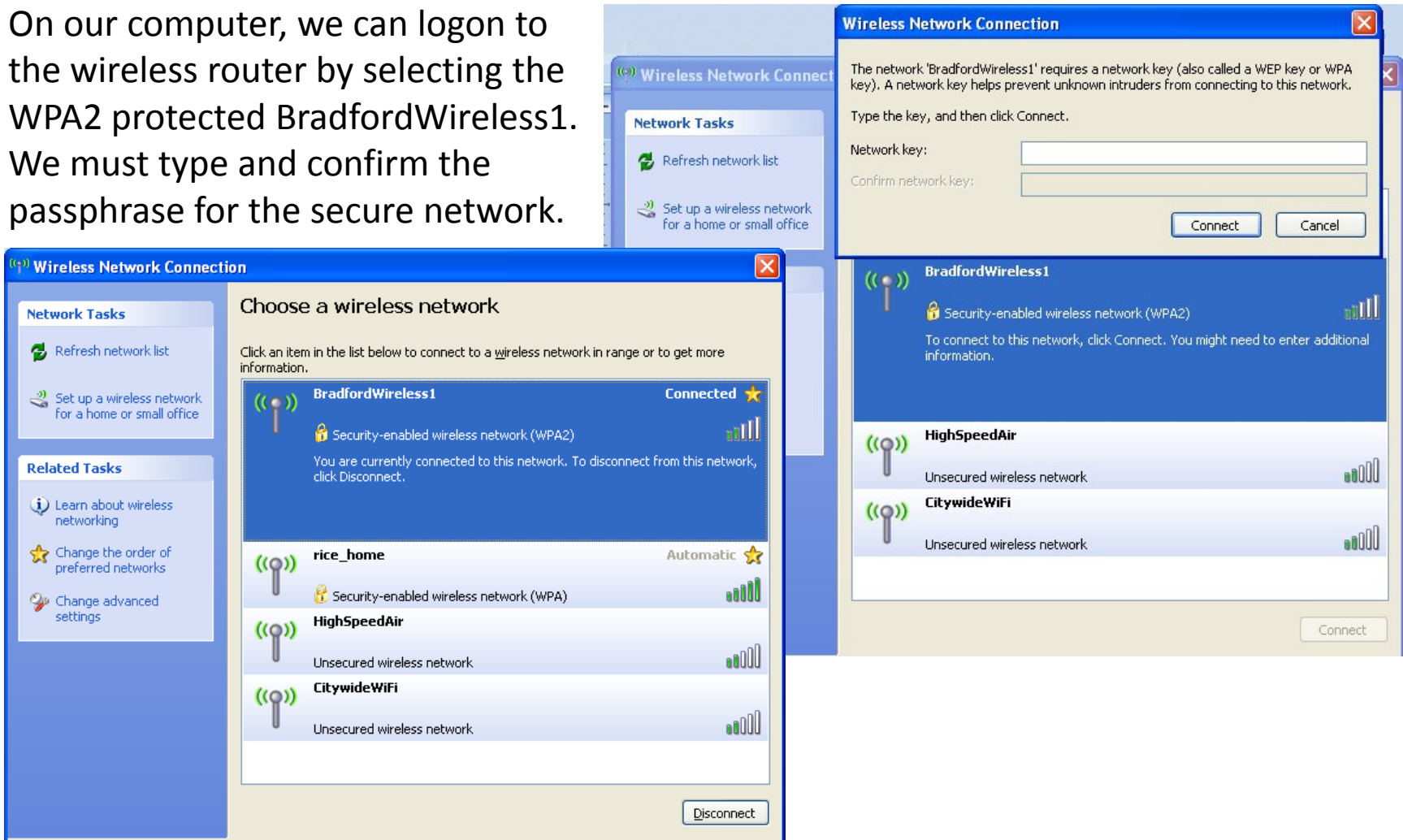
The screenshot shows the Cisco Linksys E3000 router's web interface. The top navigation bar includes the Cisco logo, the model name 'Linksys E3000', and the firmware version '1.0.01'. The main navigation menu is divided into 'Administration' (selected) and 'Status'. Under 'Administration', there are sub-menus for 'Setup', 'Wireless', 'Security', 'Storage', 'Access Restrictions', 'Applications & Gaming', and 'Administration'. The 'Administration' sub-menu is further divided into 'Management', 'Log', 'Diagnostics', 'Factory Defaults', and 'Firmware Upgrade'. The left sidebar contains 'Management', 'Local Management Access', 'Remote Management Access', and 'Advanced features'. The main content area is titled 'Router Access' and contains the following configuration options:

- Router Password:** Two password input fields, one for the password and one for re-entering to confirm.
- Access via:** Radio buttons for HTTP and HTTPS.
- Access via Wireless:** Radio buttons for Enabled and Disabled.
- Remote Management:** Radio buttons for Enabled and Disabled.
- Access via:** Radio buttons for HTTP and HTTPS.
- Remote Upgrade:** Radio buttons for Enabled and Disabled.
- Allowed Remote IP Address:** Radio buttons for Any IP Address and [IP Address Range].
- Remote Management Port:** A text input field containing '8080'.
- SIP ALG:** Radio buttons for Enabled and Disabled.

A 'Help...' link is visible on the right side of the page.

Logon to the Network

On our computer, we can logon to the wireless router by selecting the WPA2 protected BradfordWireless1. We must type and confirm the passphrase for the secure network.



Accessing the Wi-Fi Network

Once, we connect to the wireless router, we can browse the Internet at our leisure.

The screenshot shows a Windows Internet Explorer browser window displaying the World Class CAD website. The browser's address bar shows the URL <http://www.worldclasscad.com/>. The website features a navigation menu with categories such as CAD Training, Programming, Architecture, Mechanical, Civil Design, Energy Mgmt, Electrical, Designing, Mathematics, Office Aps, Ohio STEM, and Poster. A central section titled "World Class CAD Online Resources" includes a world map and lists various training topics like 2D AutoCAD, Mechanical, Electrical, Architectural, Office Trng, Drafting, Programming, Networking, Design, Microstation, progeCAD, Solid Edge, Solid Works, Civil, Math, and Project. The right sidebar contains advertisements for progeSoft's free student software, Inventor 3D Manufacturing, and Bradford School. The bottom of the page features a "Take the Virtual Tour" button, a "Visit the World Class CAD Bookstore" link, a "Create the Printed Circuit Board Schematic" graphic, and a "Need CAD Software" section.