Source code for the internal pages

This section presents commented source code for the default internal pages.

Important: *Do not create your own pages by saving a page from within your web browser. The server side code is removed when you do this and the resulting pages will not work. Use the examples in this section or those on the CD in \HTML\Colubris\Internal as the basis for your pages.*

Login page

```
<!-- Colubris -->
<!-- Default -->
<!-- iPass
<WISPAccessGatewayParam>
  <Redirect>
    <MessageType>100</MessageType>
    <ResponseCode><% iPassGetRedirectResponseCode(); %></ResponseCode>
    <AccessProcedure><% iPassGetAccessProcedure(); %></AccessProcedure>
    <LocationName><% iPassGetLocationName(); %></LocationName>
    <AccessLocation><% iPassGetAccessLocation(); %></AccessLocation>
    <LoginURL><% iPassGetLoginUrl(); %></LoginURL>
    <AbortLoginURL><% iPassGetAbortLoginUrl(); %></AbortLoginURL>
  </Redirect>
</WISPAccessGatewayParam>
-->

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
        "http://www.w3.org/TR/1999/REC-html401-19991224/loose.dtd">
<html lang="en">
<head>
  <meta http-equiv="content-type" content="text/html; charset=iso-8859-1">
  <meta http-equiv="Expires" CONTENT="0">
  <meta http-equiv="Cache-Control" CONTENT="no-cache">
  <meta http-equiv="Pragma" CONTENT="no-cache">
  <title>Login</title>

<style type="text/css">
<!--

.labels {
  font-family: verdana, sans-serif;
  }

#title {
  font-size: 14px;
  color: #000000;
  padding-left: 5px;
  }
#tags {
  font-size: 10px;
  color: #000000;
  }
#error {
  font-size: 12px;
  color: #CC0000;
  font-weight: bold;
  }

#input {
  font-family: verdana, sans-serif;
  font-size: 11px;
  width: 120px;
  color: #003366;
  }

#submit {
  font-family: verdana, sans-serif;
  font-size: 10px;
  font-weight: bold;
  color: #003366;
  }
-->
</style>
<script language="Javascript">
//Make sure the required information was entered

function setfocus() {
  if (document.forms[0]) {
    document.forms[0].elements[0].focus();
    }
  }

//-->
</script>
</head>
<body bgcolor="#FFFFFF" onLoad="setfocus();">

<form action="/goform/HtmlLoginRequest" method="POST">
<table border="0" width="99%" height="70%" cellspacing="0" cellpadding="0">
<tr><td align="center" valign="middle">

  <table border="0" width="300" cellspacing="0" cellpadding="3">
    <tr  bgcolor="#FFFFFF">
      <td>
        <img src="/logo.gif" alt="" width="125" height="50" border="0">
      </td>
    </tr>
    <tr>
      <td align="center">
        <span class="labels" ID="title">
        <%GetAuthenticationErrorMessage();%>
        <%GetRadiusReplyMessage();%>
        <%GetMsChapV2Failed();%>
        </span>
      </td>
    </tr>
  </table>

  <br>

  <table border="0" width="300" cellspacing="0" cellpadding="3" bgcolor="#CC0033">
    <tr>
      <td align="center" valign="middle" colspan="2">
        <table border="0" width="300" cellspacing="0" cellpadding="4" bgcolor="#E6E6E6">
          <tr>
            <td align="right">
              <span class="labels" ID="tags">Username:</span>
            </td>
            <td>
              <input type="text" name="username" maxlength="30" size="32">
            </td>
            <td>&nbsp;</td>
          </tr>
          <tr>
            <td align="right">
              <span class="labels" ID="tags">Password:</span>
            </td>
            <td>
              <input type="password" name="password" maxlength="30" size="32">
            </td>
            <td valign="bottom">
              <input type="submit" name="login" value="Go >>">
            </td>
          </tr>
          <tr>
            <td>
              <input type="hidden" name="original_url" value=<%GetOriginalUrl();%>>
            </td>
          </tr>
        </table>
      </td>
    </tr>
  </table>

</td></tr>
</table>

</form>

</body>
</html>
```

Transport page

```
<!-- Colubris -->
<!-- Default -->
<!-- iPass
<WISPAccessGatewayParam>
  <AuthenticationReply>
    <MessageType>120</MessageType>
    <ResponseCode><% iPassGetLoginResponseCode(); %></ResponseCode>
    <ReplyMessage><% GetRadiusReplyMessage(); %></ReplyMessage>
    <LogoffURL><% iPassGetLogoffUrl(); %></LogoffURL>
  </AuthenticationReply>
</WISPAccessGatewayParam>
-->

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<html>
<head>
  <meta http-equiv="content-type" content="text/html; charset=iso-8859-1">
  <meta http-equiv="Expires" CONTENT="0">
  <meta http-equiv="Cache-Control" CONTENT="no-cache">
  <meta http-equiv="Pragma" CONTENT="no-cache">
  <meta http-equiv="refresh" content="1; URL=<%GetWelcomeUrl();%>">
  <title>Transport</title>

<script type="text/javascript" language="Javascript">
<!--
function opensessionwin(whichone) {

  // Define the size of your remote window in pixels with "width" and "height."
  remote =
window.open("","sessionwin","width=240,height=400,toolbar=0,location=0,directories=0,status=0,me
nubar=0,scrollbars=1,resizable=1");
  if (remote.blur) remote.focus();

  // Put the full url of your remote document where you see "URL".
  remote.location.href = "<%GetSessionUrl();%>";
```

```
    if (remote.opener == null) remote.opener = window;
  remote.opener.name = "opener";
}

//-->
</script>

</head>
<body onload="opensessionwin();" bgcolor="#FFFFFF">

<font face="verdana, arial, helvetica" size="2">
<h4>This should take 1 second...</h4>

If you are not redirected within a few seconds, please <a href="<%GetWelcomeUrl();%>">click here</
a>.
If you have JavaScript disabled and the session page doesn't appear, please <a
href="<%GetSessionUrl();%>">click here</a>.

</font>

</body>
</html>
```

Session page

```
<!-- Colubris -->
<!-- Default -->
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<html>
<head>
  <meta http-equiv="content-type" content="text/html; charset=iso-8859-1">
  <meta http-equiv="Expires" CONTENT="0">
  <meta http-equiv="Cache-Control" CONTENT="no-cache">
  <meta http-equiv="Pragma" CONTENT="no-cache">
  <% SetSessionRefreshInterval("20");%>
  <title>Session</title>
</head>
<body bgcolor="#FFFFFF">

<table border="0" cellpadding="0" cellspacing="5" align="center" style="border:1px dotted #CC0000">
  <tr>
    <td colspan="2" align="center">&nbsp;<img src="/logo.gif" alt="" width="125" height="50"
border="0"></td>
  </tr>
  <tr>
    <td colspan="2">
      <font face="verdana" size="3"><b>Session</b></font>
    </td>
  </tr>
  <tr>
    <td colspan="2" align="center">
      <hr noshade size="1" color="#CCCCCC">
      <font face="verdana" size="1" color="#FF0000">
      Please bookmark this page for logout
      </font>
      <hr noshade size="1" color="#CCCCCC">
    </td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Status:</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionStateMessage(); %></b></font></td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Session Time (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionTime(); %>&nbsp;/&nbsp;<%
GetSessionRemainingTime(); %>&nbsp;/&nbsp;<% GetMaxSessionTime(); %></b></font></td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Idle time (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionIdleTime(); %>&nbsp;/&nbsp;<%
GetSessionRemainingIdleTime(); %>&nbsp;/&nbsp;<% GetMaxSessionIdleTime(); %></b></font></
td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Received Packets (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionInputPackets(); %>&nbsp;/&nbsp;<%
GetSessionRemainingInputPackets(); %>&nbsp;/&nbsp;<% GetMaxSessionInputPackets(); %></
b></font></td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Received Octets (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionInputOctets(); %>&nbsp;/&nbsp;<%
GetSessionRemainingInputOctets(); %>&nbsp;/&nbsp;<% GetMaxSessionInputOctets(); %></b></
font></td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Transmit Packets (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionOutputPackets(); %>&nbsp;/&nbsp;<%
GetSessionRemainingOutputPackets(); %>&nbsp;/&nbsp;<% GetMaxSessionOutputPackets(); %></
b></font></td>
  </tr>
  <tr>
    <td align="right"><font face="verdana" size="1">Transmit Octets (Cur/Left/Max):</font></td>
    <td><font face="verdana" size="1"><b><% GetSessionOutputOctets(); %>&nbsp;/&nbsp;<%
GetSessionRemainingOutputOctets(); %>&nbsp;/&nbsp;<% GetMaxSessionOutputOctets(); %></
b></font></td>
  </tr>
  <tr>
    <td colspan="2" align="right" valign="bottom">
      <form action="/goform/HtmlLogout" method="post" >
      <input type="submit" name="logoutsession" value="Logout">
      </form>
    </td>
  </tr>
</table>

</body>
</html>
```

Fail page

```
<!-- Colubris -->
<!-- Default -->
<!-- iPass
<WISPAccessGatewayParam>
  <LogoffReply>
    <MessageType>130</MessageType>
    <ResponseCode><% iPassGetLogoutResponseCode(); %></ResponseCode>
  </LogoffReply>
</WISPAccessGatewayParam>
-->

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<html>
<head>
  <meta http-equiv="Expires" CONTENT="0">
  <meta http-equiv="Cache-Control" CONTENT="no-cache">
  <meta http-equiv="Pragma" CONTENT="no-cache">
  <title>Window</title>
</head>
<body bgcolor="#FFFFFF">

<table border="0" cellpadding="0" cellspacing="0" width="178" style="border:1px dotted #CC0000">
  <tr>
    <td colspan="2">&nbsp;<img src="/logo.gif" alt="" width="125" height="50" border="0"></td>
  </tr>
  <tr>
    <td>&nbsp;</td>
    <td><font face="verdana" size="1"><b><%GetAuthenticationErrorMessage();%></b></font></td>
  </tr>
</table>

</body>
</html>
```

Source code for the external pages

Sample external pages are provided on the CD in the folder \HTML\Colubris\External. Three versions are included for each page: HTML, ASP, and PHP.

Welcome page

HTML

```
<!--
This file remains on your webserver and is fully customisable by you.
You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling welcome-url is:
welcome-url=https://207.35.116.198:8888/colubris-php/
welcome.php?site=%s&user=%u&wantedurl=%o
-->

<html>
<head>
    <title>Welcome</title>
</head>
<body>

Welcome

</body>
</html>
```

ASP

```
<!--
This file remains on your webserver and is fully customisable by you.
You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling welcome-url is:
welcome-url=https://207.35.116.198:8888/colubris-php/
welcome.php?site=%s&user=%u&wantedurl=%o
-->

<%@ Language=VBScript %>
<%
    site = Request("site")
    user = Request("user")
    wantedurl = Request("wantedurl")
%>
<html>
<head>
    <title>Welcome</title>
</head>
<body>

Welcome <%=user%>, to <%=site%>
<br>
The URL you were trying to access was <a href="<%=wantedurl%>"><%=wantedurl%></a>.

</body>
</html>
```

PHP

```
<!--
This file remains on your webserver and is fully customisable by you.
You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling welcome-url is:
welcome-url=https://207.35.116.198:8888/colubris-php/
welcome.php?site=%s&user=%u&wantedurl=%o

-->

<? /*
    PHP makes QUERY STRING variables immediatly available to any
    PHP scripts you embed in your file.
*/ ?>

<html>
<head>
    <title>Welcome</title>
</head>
<body>

Welcome <? echo $user; ?>, to <? echo $site; ?>
<br>
The URL you were trying to access was <a href="<? echo $wantedurl; ?>"><? echo $wantedurl; ?></
a>.

</body>
</html>
```

Goodbye page

HTML

```
<!--
This file remains on your webserver and is fully customisable by you.
For example, in this file the calling goodbye-url is:
goodbye-url=https://207.35.116.198:8888/colubris-php/goodbye.php?site=%s&user=%u
-->

<html>
<head>
    <title>Logout</title>
</head>
<body>

Thank you.

</body>
</html>
```

ASP

```
<!--
This file remains on your webserver and is fully customisable by you.

For example, in this file the calling goodbye-url is:
goodbye-url=https://207.35.116.198:8888/colubris-php/goodbye.php?site=%s&user=%u
-->

<%@ Language=VBScript %>
<%
    site = Request("site")
    user = Request("user")
    wantedURL = Request("wantedURL")
%>
<html>
<head>
    <title>Logout</title>
</head>
<body>

Thank you <%=user%>

</body>
</html>
```

PHP

```
<!--
This file remains on your webserver and is fully customisable by you.

You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling goodbye-url is:
goodbye-url=https://207.35.116.198:8888/colubris-php/goodbye.php?site=%s&user=%u

-->

<? /*
    PHP makes QUERY STRING variables immediatly available to any
    PHP scripts you embed in your file.

*/ ?>

<html>
<head>
    <title>Logout</title>
</head>
<body>

Thank you <? echo $user; ?>.

</body>
</html>
```

Login Error page

HTML

```
<!--
This file remains on your webserver and is fully customisable by you.
You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling login-err-url is:
login-err-url=https://207.35.116.198:8888/colubris-php/login-error.php?site=%s&user=%u

-->

<html>
<head>
    <title>Login Error</title>
</head>
<body>

There has been a login error.
```

```
</body>
</html>
```

ASP

```
<!--
This file remains on your webserver and is fully customisable by you.
You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling login-err-rl is:
login-err-url=https://207.35.116.198:8888/colubris-php/login-error.php?site=%s&user=%u

-->

<%@ Language=VBScript %>
<%
    site = Request("site")
    user = Request("user")
    wantedurl = Request("wantedurl")
%>
<html>
<head>
    <title>Login Error</title>
</head>
<body>
Sorry <%=user%><br>
There has been a login error.

</body>
</html>
```

PHP

```
<!--
This file remains on your webserver and is fully customisable by you.

You also have access to the CGI variables which are defined in the URL
that calls this page.

For example, in this file the calling login-err-url is:
login-err-url=https://207.35.116.198:8888/colubris-php/login-error.php?site=%s&user=%u

-->

<? /*
    PHP makes QUERY STRING variables immediately available to any
    PHP scripts you embed in your file.

*/ ?>

<html>
<head>
    <title>Login Error</title>
</head>
<body>
Sorry <? echo $user; ?>.<br>
There has been a login error.

</body>
</html>
```

Remote login page

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
    "http://www.w3.org/TR/1999/REC-html401-19991224/loose.dtd">
<html lang="en">
<head>
  <meta http-equiv="content-type" content="text/html; charset=iso-8859-1">
  <meta http-equiv="Expires" CONTENT="0">
  <meta http-equiv="Cache-Control" CONTENT="no-cache">
  <meta http-equiv="Pragma" CONTENT="no-cache">
  <title>Login</title>

<style type="text/css">
<!--

.labels {
  font-family: verdana, sans-serif;
  }

#title {
  font-size: 14px;
  color: #000000;
  padding-left: 5px;
  }
#tags {
  font-size: 10px;
  color: #000000;
  }
#error {
  font-size: 12px;
  color: #CC0000;
  font-weight: bold;
  }

#input {
  font-family: verdana, sans-serif;
  font-size: 11px;
  width: 120px;
  color: #003366;
  }

#submit {
  font-family: verdana, sans-serif;
  font-size: 10px;
  font-weight: bold;
  color: #003366;
  }
-->
</style>
<script language="Javascript">
//Make sure the required information was entered

function setfocus() {
  if (document.forms[0]) {
    document.forms[0].elements[0].focus();
    }
  }

//-->
</script>
</head>
<body bgcolor="#FFFFFF" onLoad="setfocus();">

<form action="https://cn3000.wireless.colubris.com:8090/goform/HtmlLoginRequest"
method="POST">
```

```
<table border="0" width="99%" height="70%" cellspacing="0" cellpadding="0">
<tr><td align="center" valign="middle">

    <table border="0" width="300" cellspacing="0" cellpadding="3">
        <tr  bgcolor="#FFFFFF">
            <td>
                <img src="/logo.gif" alt="" width="125" height="50" border="0">
            </td>

            <td valign="bottom" align="right">
                <span class="labels" ID="title">
            </td>
            <td valign="bottom" align="right">
                <span class="labels" ID="title">
            </td>
            <td valign="bottom" align="right">
                <span class="labels" ID="title">
            </td>
        </tr>
    </table>

    <br>

    <table border="0" width="300" cellspacing="0" cellpadding="3" bgcolor="#CC0033">
        <tr>
            <td align="center" valign="middle" colspan="2">
                <table border="0" width="300" cellspacing="0" cellpadding="4" bgcolor="#E6E6E6">
                    <tr>
                        <td align="right">
                            <span class="labels" ID="tags">Username:</span>
                        </td>
                        <td>
                            <input type="text" name="username" maxlength="30" size="32">
                        </td>
                        <td>&nbsp;</td>
                    </tr>
                    <tr>
                        <td align="right">
                            <span class="labels" ID="tags">Password:</span>
                        </td>
                        <td>
                            <input type="password" name="password" maxlength="30" size="32">
                        </td>
                        <td valign="bottom">
                            <input type="submit" name="login" value="Go >>">
                        </td>
                    </tr>
                </table>
            </td>
        </tr>
    </table>

</td></tr>
</table>

</form>

</body>
</html>
```

Chapter 16
Customizing CN3200 and customer settings

This chapter presents a summary of the configuration settings you can define to customize the operation of your public access network and customer accounts.

Overview

The CN3200 uses a third-party RADIUS server to store configuration settings for customer accounts, accounting data, as well as certain operating settings for the public access network. The configuration settings are stored in profiles, which you must create before the public access interface can be used.

The minimum setup you must define is as follows:

- **Define RADIUS client settings for the CN3200**

  Any device that uses the authentication services of a RADIUS server is called a RADIUS client. Therefore, each CN3200 is considered to be a RADIUS client and you must define client settings for each one that you intend to install.

  See page 213 for details.

- **Create a RADIUS profile for the CN3200**

  Before it can activate the public access interface, the CN3200 must log into a RADIUS server and retrieve certain operating settings which you must define. Therefore, you must create at least one RADIUS profile for use by the CN3200. If you have multiple CN3200s, they can all be associated with a single RADIUS profile.

  See page 214 for details.

- **Create a RADIUS profile for one or more customers**

  The customer profile is used to authenticate customers when they login. It contains settings that define the characteristics of their account.

RADIUS attributes

Attributes are configuration parameters that you can attach to a RADIUS profile. The CN3200 supports standard RADIUS attributes and a Colubris Networks vendor-specific attribute.

Standard RADIUS attributes

The CN3200 supports the following RADIUS attributes. (Attributes starting with MS are Microsoft and are not standard.)

Access Request

- Acct-Session-Id
- NAS-Port
- NAS-Port-Type
- User-Name
- Calling-Station-Id
- Called-Station-Id
- User-Password
- CHAP-Password
- CHAP-Challenge
- MSCHAP-Challenge
- MSCHAP-Response
- MSCHAPv2-Response
- EAP-Message
- State
- NAS-Identifier
- NAS-Ip-Address
- Framed-MTU
- Connect-Info
- Service-Type
- Message-Authenticator

Access Accept

- MS-MPPE-Recv-Key
- MS-MPPE-Send-Key
- Service-Type
- EAP-Message
- Class
- Idle-Timeout
- Session-Timeout
- Acct-Interim-Interval
- Tunnel-type
- Tunnel-meduim-type
- Tunnel-private-group

Access Reject

- MSCHAP-Error
- Reply-Message
- EAP-Message

Access Challenge

- EAP-Message
- State

Accounting Request

- User-Name
- NAS-Port
- NAS-Port-Type
- NAS-Identifier
- NAS-Ip-Address
- Acct-Status-Type
- Calling-Station-Id
- Called-Station-Id
- Acct-Event-Timestamp
- Acct-Delay-Time
- Acct-Session-Id
- Acct-Authentic
- Acct-Session-Time
- Acct-Input-Octets
- Acct-Input-Gigawords
- Acct-Input-Packets
- Acct-Output-Octets
- Acct-Output-Gigawords
- Acct-Output-Packets
- Acct-Terminate-Cause
- Class
- Framed-Ip-Address

Accounting Response

- No attribute

Interim accounting updates

To enable interim accounting updates for each customer you must define a value for the RADIUS attribute Acct-Interim-Interval. This sets the frequency with which the CN3200 will send accounting information to the RADIUS server.

Colubris Networks vendor-specific attributes

In certain cases, the set of standard RADIUS attributes needs to be extended to specify custom settings for specific types of equipment. These are called vendor-specific attributes. Colubris Networks has defined two vendor-specific attributes to support special features on the CN3200, such as the customization of the web interface and the security certificate. This attribute are:

- Colubris-AVPair
- Colubris-Intercept

These attributes conform to RADIUS RFC 2865.

You may need to define these attributes on your RADIUS server if they are not already present. In this case, you need to specify the following:

Colubris-AVPair

- SMI network management private enterprise code = 8744
- Vendor-specific attribute type number = 0
- Attribute type = string

Colubris-Intercept

- SMI network management private enterprise code = 8744
- Vendor-specific attribute type number = 1
- Attribute type = integer

Attribute value summary

The following values are permitted for the Colubris-AVPair attribute. These values are described in greater detail later in this chapter and in Chapter 15.

Important: *It is important to specify the attribute values exactly as shown below. Adding extra spaces between options will result in errors.*

CN3200 profile

```
access-list=
name,action,protocol,address,port,[account,[interval]]
use-access-list=usename
white-list=protocol,address,[port]
ssl-certificate=URL [%s] [%n]
configuration-file=URL [%s] [%n]
mac-address=address[,username[,password]]
default-user-idle-timeout=seconds
default-user-smtp-redirect=hostname:port
default-user-session-timeout=seconds
login-page= URL_of_page
transport-page= URL_of_page
session-page= URL_of_page
fail-page= URL_of_page
logo= URL_of_gif_file
messages= URL_of_text_file
welcome-url= URL_of_page [placeholder]
goodbye-url= URL_of_page [placeholder]
login-err-url= URL_of_page [placeholder]
login-url= URL_of_the_page [placeholder]
ssl-noc-certificate= URL_of_the_Certificate
ssl-noc-ca-certificate= URL_of_the_certificate
```

Customer profile

```
smtp-redirect=hostname:port
use-access-list=usename
one-to-one-nat=value
max-input-packets=value
max-output-packets=value
max-input-octets=value
max-output-octets=value
welcome-url= URL_of_page [placeholder]
goodbye-url= URL_of_page [placeholder]
login-err-url= URL_of_page [placeholder]
group=value
essid=value
```

RADIUS limitations

The maximum number of attributes the CN3200 can receive in one request is limited by the maximum packet size of the UDP protocol which is 64K. Some networks may drop fragmented UDP packets which may leave you with less than the maximum size.

Terminate-Acct-Cause values

Terminate Acct Cause values are supported as follows:

ID	Cause	Notes
1	User Request	Supported. Indicates that the customer logged out.
2	Lost Carrier	Supported. Indicates that the client station is no longer alive.
4	Idle Timeout	Supported. Customer exceeded the idle timeout value defind for the session.
5	Session Timeout	Supported. Customer exceeded maximum time defined for the session.
6	Admin Reset	Supported. Customer session was terminated by the CN3200 administrator via SNMP or the management tool.
7	Admin Reboot	Not Supported. (not applicable)
8	Port Error	Supported. If two customers are detected using the same IP address, both are logged out with this error. Another cause is if an error is encountered in an access list definition. For example, an invalid host was specified.
9	NAS Error	Not Supported. (not applicable)
10	NAS Request	Not Supported. (not applicable)
11	NAS Reboot	Supported. Customer was logged out because the CN3200 was restarted.
12	Port Unneeded	Not Supported. (not applicable)
13	Port Preempted	Not Supported. (not applicable)
14	Port Suspended	Not Supported. (not applicable)
15	Service Unavailable	Not Supported. (not applicable)
16	Callback	Not Supported. (not applicable)
17	User Error	Supported. An 801.1x client initiated a second authentication request for a customer, and this request was refused.
18	Host Request	Not Supported. (not applicable)
0x8744 (34628 decimal)	Termination	Colubris-specific termination cause. See page 229 for details.

Creating a RADIUS client entry for the CN3200

Any device that uses the authentication services of a RADIUS server is called a RADIUS client (or RAS client on some systems). Therefore, each CN3200 is considered to be a RADIUS client and you must define client settings for each one that you intend to install.

Configuration settings

You may need to supply the following information when setting up a RADIUS client entry:

- Client IP address: This is the IP address assigned to the CN3200's Internet port. If the CN3200 is using a PPTP connection to communicate with the RADIUS server, then this is the address assigned to the CN3200 by the PPTP server.
- Shared secret: Secret the CN3200 will use to authenticate the packets it receives from the RADIUS server.

Managing shared secrets

If you are using a PPPoE, DHCP, or PPTP VPN connection when communicating with the RADIUS server, make sure that the shared secret for each CN3200 is the same. Also, ensure that all possible IP addresses have been configured on the RADIUS server.

The username and password assigned to each CN3200 can be different, enabling you to differentiate between devices.

Creating a profile for the CN3200 on the RADIUS server

Before it can activate the public access interface, the CN3200 must log into a RADIUS server and retrieve certain operating settings that you must define. Therefore, you must create at least one RADIUS profile for use by the CN3200. If you have multiple CN3200s, they can all be associated with a single RADIUS profile.

Supported standard RADIUS attributes

This section presents all standard RADIUS attributes that are supported by a CN3200 profile.

Note: *In the following definitions, strings are defined as 1 to 253 characters in length.*

Access request

- Acct-Session-Id (32-bit unsigned integer): Random value generated per authentication by the CN3200.
- NAS-Identifier (string): The NAS ID set on the **Security** > **RADIUS** page for the RADIUS profile being used.
- NAS-Ip-Address 32-bit unsigned integer): The IP address of the port the CN3200 is using to communicate with the RADIUS server.
- NAS-Port (32-bit unsigned integer): Always 0.
- NAS-Port-Type (32-bit unsigned integer): Always set to 19, which represents WIRELESS_802_11.
- Calling-Station-Id (string): The MAC address of the CN3200's LAN port in IEEE format. For example: 00-02-03-5E-32-1A.
- Called-Station-Id (string): The MAC address of the CN3200's LAN port in IEEE format. For example: 00-02-03-5E-32-1A.
- User-Name (string): The username assigned to the CN3200 on the **Security** > **Authentication** page.
- User-Password (string): The password assigned to the CN3200 on the **Security** > **Authentication** page. Encoded as defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to PAP.
- CHAP-Password (string): The password assigned to the CN3200 on the **Security** > **Authentication** page. Encoded as defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to CHAP.
- CHAP-Challenge (string): Randomly generated by the product. As defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to CHAP. Length = 19 bytes.
- MSCHAP-Challenge (string): As defined in RFC 2433. Only present when the authentication method for the RADIUS profile is set to MSCHAPv1 or MSCHAPv2. Length = 8 bytes.
- MSCHAP-Response (string): As defined in RFC 2433. Only present when the authentication method for the RADIUS profile is set to MSCHAPv1. Length = 49 bytes.
- MSCHAPv2-Response (string): As defined in RFC 2759. Only present when the authentication method for the RADIUS profile is set to MSCHAPv2. Length = 49 bytes.
- EAP-Message (string): As defined in RFC 2869. Only present when the authentication method for the RADIUS profile is set to EAP-MD5.

- State (string): As defined in RFC 2865.
- Framed-MTU (32-bit unsigned integer): Hard-coded to 1496.
- Connect-Info (string): The string "HTTPS".
- Service-Type (32-bit unsigned integer): As defined in the config.cfg file. Token name = service-type-device.
- Message-Authenticator (string): As defined in RFC 2869. Always present even when not doing an EAP authentication. length = 16 bytes.
- Colubris-AVPair: See the description in the section that follows.

Access accept

- Acct-Interim-Interval (32-bit unsigned integer): When present, it enables the transmission of RADIUS accounting requests of the Interim Update type. Specify the number of seconds between each transmission.
- Session-Timeout (32-bit unsigned integer): Maximum time a session can be active. The CN3200 re-authenticates itself when this timer expires. Omitting this attribute or specifying 0 will disable the feature. (Note that the authentication interval is also configurable on the **Security > Authentication** page.
- Idle-Timeout (32-bit unsigned integer): Not supported.
- Class (string): As defined in RFC 2865.
- EAP-Message (string): Only supported when authentication is EAP-MD5. Note that the content will not be read as the RADIUS Access Accept is overriding whatever indication contained inside this packet.
- Colubris-AVPair: See the description in the section that follows.

Access reject

None.

Access challenge

None.

Accounting request

Accounting information is generated by default. To disable accounting support, open the **Security > Authentication -> Advanced Settings** page**.**

- Acct-Session-Id (32-bit unsigned integer): Random value generated by the CN3200.
- NAS-Identifier (string): The NAS ID set on the **Security > RADIUS** page for the profile being used.
- NAS-Ip-Address (32-bit unsigned integer): The IP address of the port the CN3200 is using to communicate with the RADIUS server.
- NAS-Port (32-bit unsigned integer): Always 0.
- NAS-Port-Type (32-bit unsigned integer): Always set to 19, which represents WIRELESS_802_11.
- Calling-Station-Id (string): The MAC address of the CN3200’s LAN port in IEEE format. For example: 00-02-03-5E-32-1A.
- Called-Station-Id (string): The MAC address of the CN3200’s LAN port in IEEE format. For example: 00-02-03-5E-32-1A.

- User-Name (string): The RADIUS username assigned to the CN3200 on the **Security > Authentication** page.
- Class (string). As defined in RFC 2865.
- Framed-IP-Address (32-bit unsigned integer): IP Address of the CN3200's LAN port.
- Acct-Status-Type (32-bit unsigned integer): Supported values are Accounting-On (7) and Accounting-Off (8).
- Acct-Event-Timestamp (32-bit unsigned integer): As defined in RFC 2869.
- Acct-Delay-Time (32-bit unsigned integer): As defined in RFC 2869.
- Acct-Authentic (32-bit unsigned integer): Always set to 1 which means RADIUS.

Accounting response

None.

Colubris-AVPair attribute

For each CN3200 profile you can specify one or more instances of a Colubris-AVPair attribute that will be returned upon successful authentication (RADIUS Accept). Possible values for all instance are grouped into the following categories:

Feature	Description
Custom HTML pages and URLs, and supporting files	Enables you to customize the public access interface. See Chapter 15 for details.
Access list	Enables you to create one or more access groups which define the set of network resources that are available to authenticated customers.
White list	The white list defines the set of network resources that are available to customers before they are authenticated.
Custom security certificate	Enables you to replace the Colubris Networks certificate with your own.
Configuration file	Enables you to store a configuration file at a central location to automatically update all your CN3200s.
MAC authentication	Enables you to authenticate devices based on their MAC addresses.
Default user idle timeout	Default idle timeout for all customers.
Default user session timeout	Default session timeout for all customers.
Default SMTP server	Default SMTP server to use for email redirection.

The value of a Colubris-AVPair attribute is always a string. These strings are always of the form: `<item>=<value>`

Access lists

Access lists enable you to create public areas on your network that all customers can browse, and protected areas that are restricted to specific customer accounts or groups.

Each access list is a set of rules that governs how the CN3200 controls access to network resources. You can create multiple access lists, each with multiple rules to manage the traffic on your public access network.

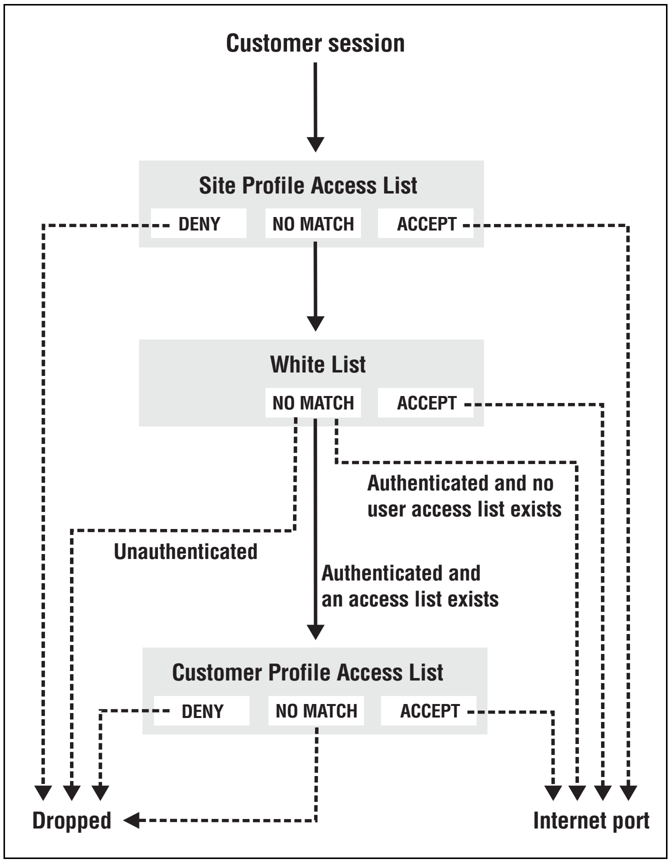
Default setting

By default no access lists are defined. This means that:

- Unauthenticated customers cannot reach any network resources other than the CN3200 login page.
- Authenticated customer have access to any network resource connected to the CN3200's Internet port.

How access lists work

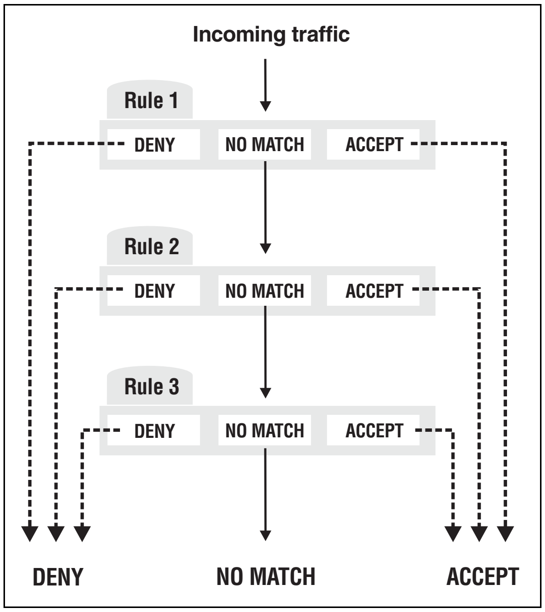
Each customer and each access point can be associated with its own access list. Incoming traffic cascades through the currently active lists. Traffic that is accepted or denied by a list is not available to the list that follows it. Traffic that passes through all lists without being accepted or denied is dropped.



How traffic flows through the access lists.

Note: *The white list is a less-powerful version of the access list that is maintained for compatibility with previous releases. Its functionality is completely superseded by the access list feature. The access list feature should be used in its place.*

Within each access list, traffic cascades through the list rules in a similar manner.



How traffic flows through the access list rules.

Rules are numbered according to the order in which they are added. Only data that is not accepted or denied by a rule is available to the next rule in the list.

Accounting support

Each rule in an access list can be configured with an account name for billing purposes. The CN3200 will send billing information based on the amount of traffic matched by the rule.

This lets you create rules to track and bill traffic to particular destinations.

Tips on using the access list

With certificates

- If you replaced the default SSL certificate on the CN3200 with one signed by a well-known CA, you should define the access list to permit access to the CA certificate for all non-authenticated customers. This enables the customer's browser to verify that the certificate is valid without displaying any warning messages.
- Customers may have configured their web browsers to check all SSL certificates against the Certificate Revocation List (CRL) maintained by the CA that issued the certificate. The location of the CRL may be configured in the browser, or embedded in the certificate. The access list should be configured to permit access to the CRL, otherwise the customer's browser will time out before displaying the login page.

Remote login page

If you are using the remote login page feature, make sure that access to the web server hosting the page must is granted to all unauthenticated customers.

SMTP redirect

If an unauthenticated customer establishes a connection to their email server, the SMTP redirect feature will not work once the customer logs in. The customer's email will still be sent to the original email server.

To avoid this, do not use an access list to open TCP port 25 for unauthenticated customers.

Defining and activating access lists

Access lists are defined by adding the following Colubris-AVPair value string to the RADIUS profile for a CN3200.

```
access-list=value
```

Access lists are activated by adding the following Colubris-AVPair value string to the RADIUS profile for a CN3200 or a customer.

`use-access-list=`value

You can define up to 32 access lists. Only one list can be active per profile.

The access list is applied before the white list.

Colubris-AVPair value string

```
access-list=
name,action,protocol,address,port,[account,[interval]]
```

```
use-access-list=usename
```

Where:

Parameter	Description
name	Specify a name (up to 32 characters long) to identify the access list this rule applies to. If a list with this name does not exist, a new list is created. If a list with this name exists, the rule is added to it.
usename	Specify the name of an existing access list. This list is activated for the current profile. Lists are checked in the order they are activated.
action	Specify what action the rule takes when it matches incoming traffic. Two options are available: • **ACCEPT** - Allow traffic matching this rule. • **DENY** - Reject traffic matching this rule.
protocol	Specify the protocol to check: **tcp, udp, icmp, all**
address	Specify one of the following: • IP address or domain name (up to 107 characters in length) • Subnet address. Include the network mask as follows: **address/subnet mask** For example: 192.168.30.0/24 • Use the keyword **all** to match any address. • Use the keyword **none** if the protocol does not take an address range (ICMP for example).
port	Specify a specific port to check or a port range as follows: • **none** – Used with ICMP (since it has no ports). • **all** - Check all ports. • **1-65535[:1-65535]** - Specify a specific port or port range.
account	Specify the name of the customer account the CN3200 will send billing information to for this rule. Account names must be unique and can be up to 32 characters in length.
interval	Specify time between interim accounting updates. If you do not enable this option, accounting information is only sent when a customer connection is terminated. Range: 5-99999 seconds in 15 second increments.

Note: *Spaces can be used instead of commas as separators.*

Example

This topology shows wireless deployment for a fictitious university campus.

The RADIUS profile for the CN3200 contains:

```
access-list=everyone,ACCEPT,tcp,192.168.50.2,80

access-list=students,ACCEPT,tcp,192.168.50.1,80,students_reg,500
access-list=students,ACCEPT,all,192.168.40.0/24,all
access-list=students,DENY,all,192.168.20.0/24,all
access-list=students,DENY,all,192.168.30.0/24,all
access-list=students,ACCEPT,all,all.all,student_internet_use,5000

access-list=faculty,ACCEPT,tcp,192.168.50.1,80,faculty_reg,500
access-list=faculty,ACCEPT,all,192.168.30.0/24,all
access-list=faculty,DENY,all,192.168.20.0/24,all
access-list=faculty,DENY,all,192.168.40.0/24,all
access-list=faculty,ACCEPT,all,all.all,faculty_internet_use,5000

use-access-list=everyone
```

The RADIUS profile for the students contains:

```
use-access-list=students
```

The RADIUS profile for the faculty contains:

```
use-access-list=faculty
```

This definition creates three access lists: everyone, students, and faculty.

Everyone

This list applies to all users (students, teachers, guests), whether they are authenticated or not. This is because the list is active on the CN3200, which is accomplished with the entry:

```
use-access-list=everyone
```

It enables everyone to access the public web server.

Students

This list applies to authenticated students only. It is composed of the following entries:

```
access-list=students,ACCEPT,tcp,192.168.50.1,80,students_reg,500
```

Enables web traffic to the registration web server. Accounting data is recorded in the account students_reg.

```
access-list=students,ACCEPT,all,192.168.40.0/24,all
```

Enables traffic to reach the student segment.

```
access-list=students,DENY,all,192.168.20.0/24,all
access-list=students,DENY,all,192.168.30.0/24,all
```

These two entries deny access to the faculty subnet and the NOC.

```
access-list=students,ACCEPT,all,all.all,student_internet_use,5000
```

Enables all other traffic to reach the Internet (via routers on the backbone LAN and the router in the NOC). If this last rule did not exist, this traffic would be dropped.

Faculty

This list applies to authenticated faculty members only. It is composed of the following entries:

```
access-list=faculty,ACCEPT,tcp,192.168.50.1,80,faculty_reg,500
```

Enables web traffic to the registration web server. Accounting data is recorded in the account faculty_reg.

```
access-list=faculty,ACCEPT,all,192.168.30.0/24,all
```

Enables traffic to reach the faculty segment.

```
access-list=faculty,DENY,all,192.168.20.0/24,all
access-list=faculty,DENY,all,192.168.40.0/24,all
```

These two entries deny access to the student subnet and the NOC.

```
access-list=faculty,ACCEPT,all,all.all,faculty_internet_use,5000
```

Enables all other traffic to reach the Internet (via routers on the backbone LAN and the router in the NOC). If this last rule did not exist, this traffic would be dropped.

White list

A white list enables you to specify the set of network resources that an unauthenticated customer has access to. You can define a specific white list for each CN3200. These definitions are automatically implemented by the CN3200 by adding the appropriate rules to the firewall.

Note: *The white list has been superseded by the access list feature. However, the white list remains supported for backwards compatibility.*

Colubris-AVPair value string

`white-list=`*`protocol`*`,`*`address`*`,[`*`port`*`]`

Where:

Parameter	Description
protocol	Specify the protocol to allow traffic on: `tcp, udp, icmp, all`.
address	Specify the IP address or domain name of a host, or the IP address of a subnet. Use the keyword `all` to match any address. When specifying an IP subnet you must include the network mask in the following format: `address/subnet mask`
port1	Specify the specific port to allow traffic on, or a range. Not valid if the `all` option is used for *`protocol`*. Use the following syntax to specify a range: `1-65535[:1-65535]` A range must be supplied for `tcp` or `udp`. A single port must be specified for `icmp`.

Note: *Spaces can be used instead of commas as separators.*

The white list applies to the CN3200 itself, and all client stations connected to it. This means that if you are using customized URLs for the public access interface, the URLs for the Login Error and Goodbye pages must specify hosts that are included in the white list.

You can specify up to 128 Colubris-AVPair values containing white list definitions.

Examples

```
white-list=all,192.168.1.10
white-list=tcp,adm.colubris.com,80:90
white-list=udp,192.168.1.0/255.255.255.0,8090:8090
white-list=tcp,192.168.1.0/24,443
```

Custom SSL certificate

The CN3200 can retrieve a custom SLL security certificate to replace the Colubris Networks certificate that is included by default. For more information on certificates, see Chapter 14.

Colubris-AVPair value string

```
ssl-certificate=URL [%s] [%n]
```

Where:

Parameter	Description
URL	Specify the URL that points to the new certificate.

By using the following placeholder, you can customize the URL for each CN3200. This is useful when you need to update multiple units.

Placeholder	Description
%s	The login name assigned to the CN3200.
%n	The NAS ID assigned to the CN3200.

The certificate is encoded using PKCS#12 format, and will contain:

- the private key of the web server
- the certificate of the web server

The file is locked using a password.

Example

```
ssl-certificate=http://www.colubris.com/%s_certificate
```

Configuration file

The CN3200 can retrieve and load a new configuration file automatically, based on an URL you specify.

Colubris-AVPair value string

```
configuration-file=URL [%s] [%n]
```

Where:

Parameter	Description
URL	Specify the URL that points to the new configuration file.

By using the following placeholder, you can customize the URL for each CN3200. This is useful when you need to update multiple units.

Placeholder	Description
%s	The login name assigned to the CN3200.
%n	The NAS ID assigned to the CN3200.

Example

```
configuration-file=http://www.colubris.com/%s_configfile
```

MAC authentication

The CN3200 can authenticate devices based on their MAC address. This is useful for authenticating devices that do not have a web browser (cash registers, for example). It can also be used to authenticate the CN300.

To make use of this feature you need to define a RADIUS user account for each device as follows:

- username: Set this to the username you specified in the mac-address value string. If no username is specified, set the account name to the MAC address of the device. Use dashes to separate characters in the address. For example: 00-20-E0-6B-4B-44.
- password: Set this to the password you specified in the mac-address value string. If no password is specified, set this to the same password that is used for the user account you defined for the CN3200 on the **Security > Authentication** page.

Important: *The username and password are not encrypted for transmission so it is important that the link with the RADIUS server is secure.*

Colubris-AVPair value string

```
mac-address=address[,username[,password]]
```

Where:

Parameter	Description
address	Specify the MAC address of the device to authenticate. Use dashes to separate characters in the address. Do not use colons (:). For example: 00-20-E0-6B-4B-44.
username	Specify the username to associate with this MAC address. Maximum 253 alphanumeric characters. The username field cannot contain a comma.
password	Specify the password to associate with this MAC address. Maximum 253 alphanumeric characters. The password field cannot contain a comma.

Example

Consider the scenario where several CN300s are installed with a CN3200. If the CN300s are going to perform firmware upgrades from a remote web or FTP server, they will need to log in to the public access network. By using MAC-based authentication, this can easily be accomplished. (This also requires that the access list on the CN3200 permits access to the web or FTP server.)

Default user idle timeout

Use this to set the default idle timeout for all customers whose RADIUS profile does not contain a value for the RADIUS attribute *idle-timeout*.

Colubris-AVPair value string

```
default-user-idle-timeout=seconds
```

Where:

Parameter	Description
seconds	Specify the maximum amount of time a customer session can be idle. Once this time expires, the session is automatically terminated. A value of 0 means no timeout.

Default user session timeout

Use this to set the default session timeout for all customers whose RADIUS profile does not contain a value for the RADIUS attribute *session-timeout*.

Colubris-AVPair value string

```
default-user-session-timeout=seconds
```

Where:

Parameter	Description
seconds	Specify the maximum amount of time a customer session can be connected. Once this time expires, the session is automatically terminated. A value of 0 means no timeout.

Default SMTP server

Use this to set the default SMTP server address for all customer sessions. This address is used if a specific server is not set for a particular customer. See page 228 for details.

Colubris-AVPair value string

```
default-user-smtp-redirect=hostname:port
```

Where:

Parameter	Description
hostname	Specify the the IP address or domain name of the e-mail server. Maximum length is 253 characters.
port	Specify the the on the e-mail server to relay to. Range: 1 to 65535.

Creating customer profiles on the RADIUS server

You must create at least one RADIUS customer profile. Multiple customer accounts can be associated with a single RADIUS profile.

Supported RADIUS attributes

This section presents all RADIUS and Colubris attributes that are supported by for a CN3200 profile.

Note: *In the following definitions, strings are defined as 1 to 253 characters in length.*

Access request

- Acct-Session-Id (32-bit unsigned integer): Random value generated by the CN3200.
- NAS-Identifier (string): The NAS ID set on the **Security > RADIUS** page for the profile being used.
- NAS-Ip-Address (32-bit unsigned integer): The IP address of the port the CN3200 is using to communicate with the RADIUS server.
- NAS-Port (32-bit unsigned integer): A virtual port number starting at 1. Assigned by the CN3200.
- NAS-Port-Type (32-bit unsigned integer): Always set to 19, which represents WIRELESS_802_11.
- Calling-Station-Id (string): The MAC address of the CN3200's LAN port in IEEE format. For example: 00-02-03-5E-32-1A.
- State (string): As defined in RFC 2865.
- Framed-MTU (32-bit unsigned integer): Hard-coded value of 1496. The value is always four bytes lower than the wireless MTU maximum which is 1500 bytes in order to support IEEE802dot1x authentication.
- Connect-Info (string): The string "HTTPS".
- Service-Type (32-bit unsigned integer): As defined in the config.cfg file. Token name = service-type-user.
- Message-Authenticator (string): As defined in RFC 2869. Always present even when not doing an EAP authentication. length = 16 bytes.
- User-Name (string): The username assigned to the customer or a device when using MAC authentication.
- User-Password (string): The password supplied by a customer or device when logging in. Encoded as defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to PAP.
- CHAP-Password (string): The password assigned to the CN3200 on the **Security > Authentication** page. Encoded as defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to CHAP.
- CHAP-Challenge (string): Randomly generated by the product. As defined in RFC 2865. Only present when the authentication method for the RADIUS profile is set to CHAP. Length = 19 bytes.
- MSCHAP-Challenge (string): As defined in RFC 2433. Only present when the authentication method for the RADIUS profile is set to MSCHAPv1 or MSCHAPv2. Length = 8 bytes.
- MSCHAP-Response (string): As defined in RFC 2433. Only present when the authentication method for the RADIUS profile is set to MSCHAPv1. Length = 49 bytes.

- MSCHAPv2-Response (string): As defined in RFC 2759. Only present when the authentication method for the RADIUS profile is set to MSCHAPv2. Length = 49 bytes.
- EAP-Message (string): As defined in RFC 2869. Only present when the authentication method for the RADIUS profile is set to EAP-MD5.
- Colubris-AVPair: See the description in the section that follows.

Access accept

- Acct-Interim-Interval (32-bit unsigned integer): When present, it enables the transmission of RADIUS accounting requests of the Interim Update type. Specify the number of seconds between each transmission.
- Session-Timeout (32-bit unsigned integer): Maximum time a session can be active. The CN3200 re-authenticates itself when this timer expires. Omitting this attribute or specifying 0 will disable the feature. (Note that the authentication interval is also configurable on the **Security > Authentication** page.
- Idle-Timeout (32-bit unsigned integer): Maximum idle time in seconds allowed for the customer. Once reached, the customer session is terminated with termination-cause IDLE-TIMEOUT. Omitting the attribute or specifying 0 disables the feature.
- Class (string): As defined in RFC 2865.
- EAP-Message (string): Only supported when authentication is EAP-MD5. Note that the content will not be read as the RADIUS Access Accept is overriding whatever indication contained inside this packet.
- MS-MPPE-Recv-Key: As defined by RFC 3078.
- MS-MPPE-Send-Key: As defined by RFC 3078.
- Tunnel-type: Only used when assigning a specific VLAN number to a customer. In this case it must be set to "VLAN".
- Tunnel-medium-type = Only used when assigning a specific VLAN number to a customer. In this case it must be set to "802".
- Tunnel-private-group = Only used when assigning a specific VLAN number to a customer. In this case it must be set to the VLAN number.

Access reject

- MSCHAP-Error (string): A MSCHAP specific error as defined by RFC 2433.
- Reply-Message (string): This string (as defined in RFC 2865) is recorded and passed as is to the GetReplyMessage() asp function. Only a single instance is supported.
- EAP-Message (string): Only supported when authentication is EAP-MD5 or with IEEE802dot1x. Note that the content will not be read as the RADIUS Access Reject is overriding whatever indication contained inside this packet. As defined in RFC 2869.
- Colubris-Intercept: See the description in the section that follows.
- Colubris-AVPair: See the description in the section that follows.

Access challenge

- EAP-Message (string): One or more occurrences of this attribute is supported inside the same packet. All occurrence are concatenate and transmitted to the IEEE802dot1x client as is. As defined in RFC 2869.
- State (string): As defined in RFC 2865.

Accounting request

Accounting information is generated by default. To disable accounting support, open the **Security** > **Authentication** page**.**

- Acct-Session-Id (32-bit unsigned integer): Random value generated by the CN3200.
- NAS-Identifier (string): The NAS ID set on the **Security** > **RADIUS** page for the profile being used.
- NAS-Ip-Address (32-bit unsigned integer): The IP address of the port the CN3200 is using to communicate with the RADIUS server.
- NAS-Port (32-bit unsigned integer): A virtual port number starting at 1. Assigned by the CN3200.
- NAS-Port-Type (32-bit unsigned integer): Always set to 19, which represents WIRELESS_802_11.
- Calling-Station-Id (string): The MAC address of the CN3200's LAN port in IEEE format. For example: 00-02-03-5E-32-1A.
- The MAC address of the wireless port the customer is associated with.Class (string): As defined in RFC 2865.
- User-Name (string): The username assigned to the customer or to a device when using MAC authentication.
- Framed-IP-Address (32-bit unsigned integer): IP Address of the customer's station.
- Acct-Status-Type (32-bit unsigned integer): Supported value are Start (1), Interim Update (3), and Stop (2).
- Acct-Event-Timestamp (32-bit unsigned integer): As defined in RFC 2869.
- Acct-Delay-Time (32-bit unsigned integer): As defined in RFC 2865.
- Acct-Authentic (32-bit unsigned integer): Always set to 1 which means RADIUS.
- Acct-Session-Time (32-bit unsigned integer): Number of seconds this session since this session was authenticated. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Input-Octets (32-bit unsigned integer): Low 32-bit value of the number of octets/bytes received by the customer. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Input-Gigawords (32-bit unsigned integer): High 32-bit value of the number of octets/bytes received by the customer. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Input-Octets (32-bit unsigned integer): Number of packets received by the customer. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Output-Octets (32-bit unsigned integer): Low 32-bit value of the number of octets/bytes sent by the customer. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Output-Gigawords (32-bit unsigned integer): High 32-bit value of the number of octets/bytes sent by the customer. Only present when Acct-Status-Type is Interim-Update or Stop. As defined in 2869.
- Acct-Output-Octets (32-bit unsigned integer): Number of packets sent by the customer. Only present when Acct-Status-Type is Interim-Update or Stop.
- Acct-Terminate-Cause (32-bit unsigned integer): Termination cause for the session See RFC 2866 for possible values. Only present when Acct-Status-Type is Stop.

Accounting response

None.

Colubris-AVPair attribute

For each customer profile you can specify one or more instances of a Colubris-AVPair attribute that will be sent when requesting authentication (RADIUS Requrest) or returned upon successful authentication (RADIUS Accept).

Possible values for all instance are grouped into the following categories:

Feature	Description	RADIUS packet
SMTP redirection	Activates support for the CN3200 e-mail redirection feature.	Access accept
URLs for custom HTML pages	Enables you to customize the public access interface for a particular customer. See Chapter 15 for details.	Access accept
Access list	Activates support for an access list	Access accept
One-to-one NAT	Activates support for one-to-one NAT (See page 90 for details).	Access accept
Quotas	Enables upload and download limits to be set individually for each customer.	Access accept
Group name	Sends the group name of the wireless access point the customer is associated with.	Access request
SSID	Sends the SSID of the wireless access point the customer is associated with.	Access request

Colubris-Intercept attribute

For each customer profile, you can specify the Colubris-Intercept attribute to redirect traffic from this customer into a GRE tunnel.

Attribute value

- 0: Do not intercept customer traffic.
- 1: Intercept customer traffic and redirect into GRE tunnel.

Setting up an intercept

1. Open the **Network > GRE** page and define a tunnel to carry th e intercepted traffic.
2. Open the **Wireless > WLAN profiles** page and click the appropiate WLAN profile.
3. Enable the **Intercepted user traffic** option in the **Traffic Tunneling (GRE)** box, and set it to the GRE tunnel you just defined.

SMTP redirection

The CN3200 is able to provide SMTP email service on a per-customer basis. This enables customers to send e-mail while on the road without the restrictions imposed by most ISPs regarding the source address of outgoing mail. It works by intercepting the call to a customer's e-mail server and redirecting it to an SMTP server that you configure.

Important: *For mail redirection to work, the customer's email server name must be publicly known. If the e-mail server name cannot be resolved, mail redirection will fail.*

Important: *If an unauthenticated customer establishes a connection to their email server, the SMTP redirect feature will not work once the customer logs in. The customer's email will still be sent to the original email server. To avoid this, do not use an access list to open TCP port 25 for unauthenticated customers.*

Colubris-AVPair value string

```
smtp-redirect=address
```

Where:

Parameter	Description
address	Specify the IP address or domain name of the e-mail server which will be used to send outgoing redirected mail.

Example

```
smtp-redirect=smtp.colubris.com
```

Access list

An access list is a set of rules that govern how the CN3200 controls customer access to network resources. Access lists are defined in the profile for the CN3200 (see page 216) and are activated in the customer profiles as needed.

Only one access list can be activated per profile. Access lists are applied before any white lists.

Colubris-AVPair value string

```
use-access-list=usename
```

Where:

Parameter	Description
usename	Specify the name of an existing access list. This list is activated for the current profile. Lists are checked in the order they are activated.

One-to-one NAT

Add this attribute if the customer requires a unique IP address when NAT is enabled on the CN3200. For more information see "One-to-one NAT" on page 90.

Colubris-AVPair value string

```
one-to-one-nat=value
```

Where:

Parameter	Description
value	Set this to 1 to activate one-to-one NAT support.

Quotas

These attributes let you define upload and download limits for each customer. Limits can be defined in terms of packets or octets (bytes).

Colubris-AVPair value string

```
max-input-packets=value
max-output-packets=value
max-input-octets=value
max-output-octets=value
```

Where:

Parameter	Description
value	For packets: 32-bit unsigned integer value. For octets: 64-bit unsigned integer value.

When a customer session is terminated based on a quota, a new non-standard termination cause is used. The value for this termination cause is 0x8744. You can customize this by modifying the value of "quota-exceeded-cause" in the "IPRULESMGR" section of the configuration file. See Chapter 16 for instructions on how to do this.

The text value of for the termination cause is defined in the message.txt file under the token "stat-quota-exceeded". The default value for this token is "Logged out. (Quota Exceeded.)". This value can be displayed with the ASP function GetAuthenticationErrorMessage(). See page 184 for details.

Displaying quota information

A series of ASP functions are available that enable you to display quota information on the session page. For details, see “Session quotas” on page 188.

Group name

This feature only applies when location-aware authenticaiton is being used (**Security > Authentication > Advanced**).

Add this attribute to have the CN3200 send the group name of the access point the customer is associated with in the Access request packet.

Colubris-AVPair value string

```
group=value
```

Where:

Parameter	Description
value	Name of the access point the customer is associated with.

SSID

Add this attribute to have the CN3200 send the SSID of the access point the customer is associated with in the Access request packet.

Colubris-AVPair value string

```
ssid=value
```

Where:

Parameter	Description
value	SSID of the access point the customer is associated with.

VLAN support

Set the following standard RADIUS attributes to assign VLAN numbers on a per-customer basis.

Note: *The CN3200 does not directly support VLANs. VLAN support is available when usingg CN300s as satellites stations only.*

RADIUS attributes

```
tunnel-type=VLAN
tunnel-medium-type=802
tunnel-type=value
```

Where:

Parameter	Description
value	VLAN number to assign.

Creating administrator profiles on the RADIUS server

If you want to support multiple administrator names and passwords, you must use a RADIUS server to manage them. The CN3200 only supports a single admin name and password internally.

Important: *Improper configuration of the administrator profile could expose the CN3200 to access by any customer with a valid account. The only thing that distinguishes an administrative account from that of a standard customer account is the setting of the service type. Make sure that a customer is not granted access if service type is not Administrative,*

This is the reason why it may be prudent to use RADIUS Server 2 to handle administrator logins. This practice reduces the risk of a bad configuration on the RADIUS server side creating a security hole.

Supported RADIUS attributes

Admin Access Request

- User-Name (string): The username assigned to the customer or a device when using MAC authentication.
- NAS-Identifier (string): The NAS ID set on the **Security** > **RADIUS** page for the profile being used.
- Service-Type (32-bit unsigned integer): As defined in RFC 2865. Set to a value of 6, which indicates SERVICE_TYPE_ADMINISTRATIVE.
- Framed-MTU (32-bit unsigned integer): Hard-coded value of 1496. The value is always four bytes lower than the wireless MTU maximum which is 1500 bytes in order to support IEEE802dot1x authentication.
- MSCHAP-Challenge (string): As defined in RFC 2433. Only present when the authentication scheme on the **Security** > **RADIUS** page is set to MSCHAPv1 or MSCHAPv2. Length = 8 bytes.
- MSCHAP-Response (string): As defined in RFC 2433. Only present when the authentication scheme on the **Security** > **RADIUS** page is set to MSCHAPv1. Length = 49 bytes.

Admin Access Accept

- None supported.

Admin Access Reject

- None supported

Admin Access Challenge

- None supported

Admin Accounting Request

- Not supported

Admin Accounting Response

- Not supported

Chapter 17
Sample setup - Backend software

This chapter provides step-by-step instructions for installing and configuring the necessary backend software to support a public access hotspot. You can use this setup as a platform to experiment with the CN3200 feature set.

IMPORTANT: Before reading this chapter you should familiarize yourself with the concepts discussed in Chapter 15 and Chapter 16.

Overview

This sample will be constructed using the following components:

- a fully-functional evaluation version of Funk Steel Belted Radius Server
- an SSL-capable version of the Apache open source web server
- a win32 version of PHP
- a win32 version of MySQL open source database software
- various HTML pages, scripts, RADIUS profiles designed to illustrate how to exploit the information provided by a CN3200 in a backend system, including creation of SSL certificates,
- a set of PHP scripts for easy administration of the database

CAUTION

The installation described in this chapter should **not** be used in a live setup without making the appropriate changes to guarantee the security of the web server and other components. If you do not know how to do this yourself, you should contact a security expert for assistance. It is beyond the scope of this document to address these security issues.

Important: *Apache 1.2.x should never be used in a production environment on a Windows server.*

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Prerequisites

Software

- Windows 2000 Professional, Server, or Advanced Server (with Service Pack 3), and all recommended updates
- Steel Belted Radius v 4.0 from Funk Software (evaluation version)
- PHP
- MySQL
- phpMyAdmin
- The Colubris Backend archive.

See “Retrieve software” on page 237 for information on obtaining this software.

Hardware

- a network hub
- a second network hub or a cross-over cable
- a computer capable of running Windows 2000 Professional, Server, or Advanced Server, connected to the hub
- optionally, you can add a second computer capable of running a web server
- a CN3200
- a second computer with a JavaScript-enabled web browse

Skills

- Familiarity with the installation and operation of TCP/IP-based networks.
- Basic knowledge of Windows 2000, including how to use a Windows command-line session.

Equipment setup

This section illustrates the hardware setup that was used to create the sample backend configuration described in this chapter. If you duplicate this setup, you will not have to change any of the IP addresses supplied in the example.

Topology

The goal of this setup is to simulate a working environment with the least amount of equipment. To this end, the ‘public network’ is considered to be any device connected to the LAN port on the CN3200. The ‘protected network resources’ are connected to the Internet port on the CN3200. In this example, both Server 1 and Server 2 are on the protected network. Server 1 is used to host a remote login page and a RADIUS server. Server 2 is used to simulate an external web server.

See “Wiring details” on page 358 for information on how to build an x-over cable.

To test the setup when installation and configuration is complete, you will use the client station to browse the web server installed on Server 2. The CN3200 will intercept the request and redirect the web browser to the public access login page. After you log in, the CN3200 will display the welcome page. This page will contain the URL of the originally requested web server (Server 2). You can then click the URL to reach Server 2.

About the components

Server 1

Server 1 hosts the remote login page and RADIUS server. The following software is installed on it:

- Funk Steel Belted Radius Server
- Apache web server with SSL support (OpenSA package)
- PHP server-side scripting language
- MySQL database
- Colubris Backend archive which contains configuration files for RADIUS and MySQL as well as new pages for public access interface

Server 2

Server 2 is can be used to test the setup once it is complete. You should install a web server on this computer. This example uses IIS running on Windows 2000 professional.

If you are only using one server, then Server 1 already has a web server running on it.

Client station

The client station is required to test the setup once it is complete. It requires a web browser. The DHCP server on the CN3200 will assign an IP address to this computer.

Step 1: Retrieve software

Server 1

Create temporary directory on Server 1. For this example, use the directory **c:\opensource**.

Download the following software into this directory.

- Funk Steel Belted Radius Server v4.04 (funk.com)

  Evaluation version (not open source)
- OpenSA v1.0.4

  http://www.opensa.org/files/1.0.4/opensa_1.0.4bin.exe

  Contains Apache web server and SSL support
- PHP v4.3.2

  http://www.php.net/downloads.php

  Filename is php-4.3.2-Win32.zip
- phpMyAdmin v.2.5.2-pl1

  http://sourceforge.net/projects/phpmyadmin/

  Filename is phpMyAdmin-2.5.2-pl1-php.zip

  If this version is not available, then you may be able to find it here: http://museum.php.net/win32
- MySQL v3.23.49 or higher (www.mysql.com)
- MySQL Connector/ODBC v3.51.06

  http://www.mysql.com
- Colubris Backend archive (backend.zip). This file is available on the CD or on the Colubris web site in the Support section.

Server 2

No software other than Windows 2000 Professional, Server, or Advanced Server (with Service Pack 3) is required.

Step 2: Install configure software on Server 1

Windows 2000

1. Install Windows 2000 Professional, Server, or Advanced Server and then install Service Pack 3. Make sure you also install all the latest updates.
2. Disable the **IAS** and **IIS** services on Windows 2000 Server, or Advanced Server. This is required so that they do not conflict with Steel-Belted Radius and Apache.
3. Connect Server 1 to the hub and assign a static IP address to it. For this example, use the address 192.168.2.99.
4. Shut down and restart Server 1.

Colubris backend archive

1. Extract the contents of **backend.zip** into a working directory. For this example, use the directory **c:\colubris**.
2. If the address of Server 1is not 192.168.2.99, then:
   - Edit **c:\colubris\radius\example.rif**, and replace all instances of the address **192.168.2.99** with the IP address (or domain name) of Server 1.
   - Edit **c:\colubris\web\demo-php\login.php**, and replace all instances of the address **192.168.2.99** with the IP address (or domain name) of Server 1.
   - Edit **c:\colubris\web\demo-php\noc\noc.asp**, and replace all instances of the address **192.168.2.99** with the IP address (or domain name) of Server 1.
   - Edit **c:\colubris\web\demo-php\upload\login.html**, and replace all instances of the address **192.168.2.99** with the IP address (or domain name) of Server 1.

Note: *In a production setup you should use the domain name to identify Server 1 to avoid getting security warnings from web browsers due to X.509 certificate inconsistencies.*

Steel-Belted Radius

1. Retrieve **Funk Steel Belted Radius Server v4.04 Evaluation version**, from funk.com.
2. Run the executable installation file and accept all default installation settings. When prompted, select the 30 day trial.

Important

If you encounter the following error message when trying to start the Steel-Belted Radius NT Service:

```
Services:  Error 1068:  The dependency service or group failed to
start.
```

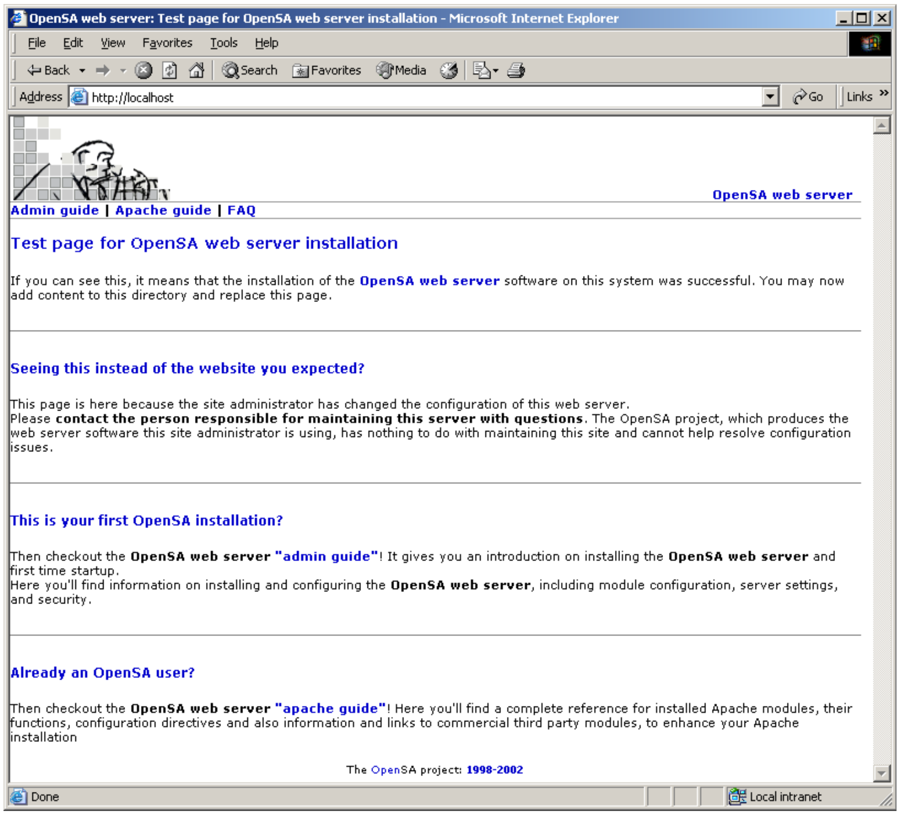
Refer to Tech Note RD230 on the Funk web site for a solution.

http://notesnt.funk.com/TechNotenewweb.nsf/0/
6aa7095c3c6b0e4f85256aca0003b458?OpenDocument

Apache

1. Run **c:\opensource\opensa_1.0.4bin.exe** and accept all default installation settings**.**
2. After installation is complete, open a Windows command-line session.
3. Run **c:\opensa\apache\apache.exe**. This starts the web server.
4. Launch your web browser and point it to: **http://localhost**

   The following page should open:



OpenSA web server

Admin guide | Apache guide | FAQ

Test page for OpenSA web server installation

If you can see this, it means that the installation of the **OpenSA web server** software on this system was successful. You may now add content to this directory and replace this page.

Seeing this instead of the website you expected?

This page is here because the site administrator has changed the configuration of this web server.
Please **contact the person responsible for maintaining this server with questions.** The OpenSA project, which produces the web server software this site administrator is using, has nothing to do with maintaining this site and cannot help resolve configuration issues.

This is your first OpenSA installation?

Then checkout the **OpenSA web server "admin guide"**! It gives you an introduction on installing the **OpenSA web server** and first time startup.
Here you'll find information on installing and configuring the **OpenSA web server**, including module configuration, server settings, and security.

Already an OpenSA user?

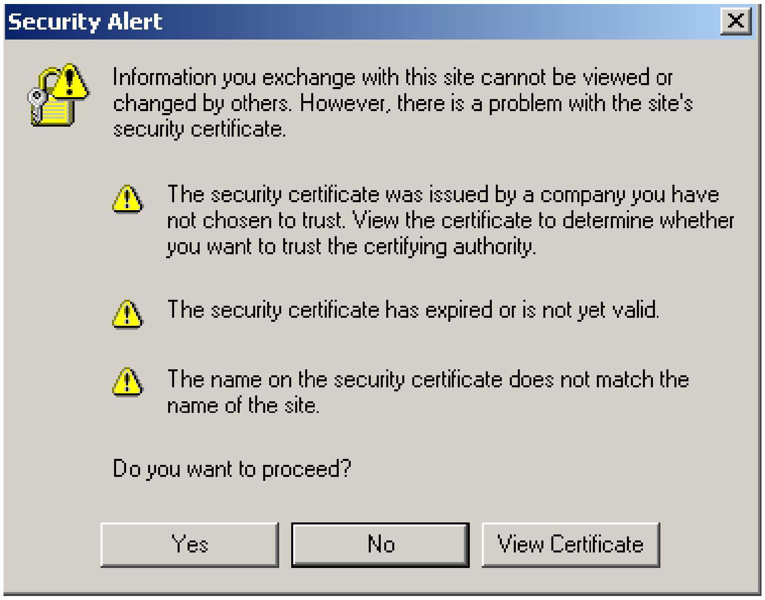
Then checkout the **OpenSA web server "apache guide"**! Here you'll find a complete reference for installed Apache modules, their functions, configuration directives and also information and links to commercial third party modules, to enhance your Apache installation

The OpenSA project: **1998-2002**

5. Close the command-line session. This stops the Apache server.
6. Launch a new command-line session.
7. Run **c:\opensa\apache\apache.exe –D SSL**. This starts Apache in secure mode.

8. Point your web browser to: **https://localhost**

   The following message box should open:



Security Alert

Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.

The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.

The security certificate has expired or is not yet valid.

The name on the security certificate does not match the name of the site.

Do you want to proceed?

   This message is displayed because:

   - the default SSL certificate that comes with the OpenSA version of Apache does not match the DNS name present in the certificate

     and

   - the default SSL certificate has not been signed by a certificate authority known to your web browser.

   Later in this example, instructions are provided for eliminating this message.

9. Click **Yes**. The OpenSA test page will open again. This time in an HTTPS session.

10. Close the command-line session Apache is running in.

Sample pages

Sample pages are provided to enable you to modify the public access interface as described in Chapter 15: Customizing the public access interface. Install these sample pages as follows:

1. Copy the directory **c:\colubris\web\demo-php** to the directory **c:\opensa\apache\htdocs**

PHP 4.2.3

1. Extract **php-4.x.x-Win32.zip** into **c:\**
2. **Rename c:\php-4.x.x to c:\php**.
3. Copy the following files as indicated. If you are prompted to replace the files, do so.

File	Source	Target
php.ini	**c:\colubris\php\**	**%SystemRoot%** This is typically **\WINNT**. You can check the actual location using the following command in a command-line session: **echo %systemroot%.**
phpinfo.php	**c:\colubris\php\**	**c:\OpenSA\Apache\htdocs**
php4ts.dll	**c:\Php**	**c:\OpenSA\Apache\**
httpd.conf	**c:\colubris\Apache**	**c:\OpenSa\Apache\conf\**

MySQL

1. Extract **mysql-4.0.14b-win.zip** into a temporary directory, and then run **setup.exe**. Accept all default installation options.
2. Double click **MyODBC-3.51.06.exe**. Accept all default installation options.

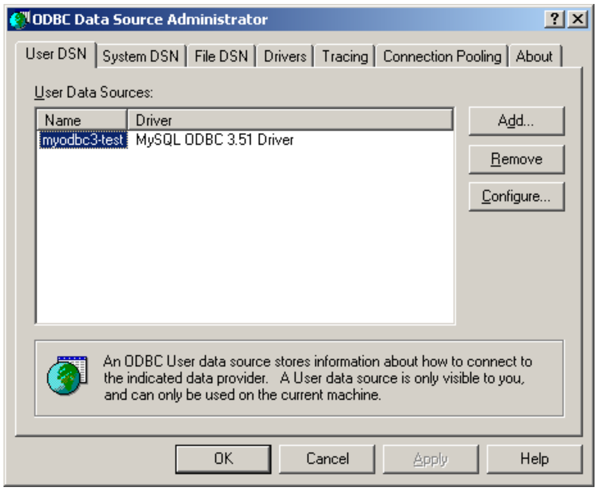
   At the end of the installation procedure, MySQL will be installed in **c:\mysql**.

Configure the OBDC data source

The OBDC database acts as the repository for all the parameters for each user account. The Steel-Belted Radius server retrieves account information from the database and uses the database to maintain accounting and usage information for each user.

1. Open a command-line session.
2. Run **odbcad32.exe**.

   The following window opens:

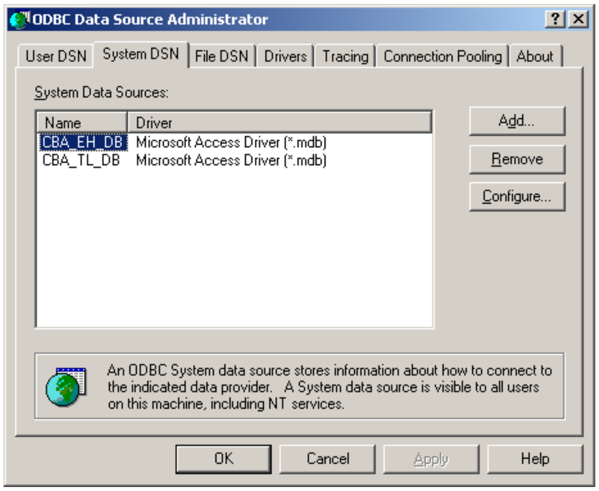


User Data Sources:

Name	Driver
myodbc3-test	MySQL ODBC 3.51 Driver

An ODBC User data source stores information about how to connect to the indicated data provider. A User data source is only visible to you, and can only be used on the current machine.

3. Click the **System DSN** tab.



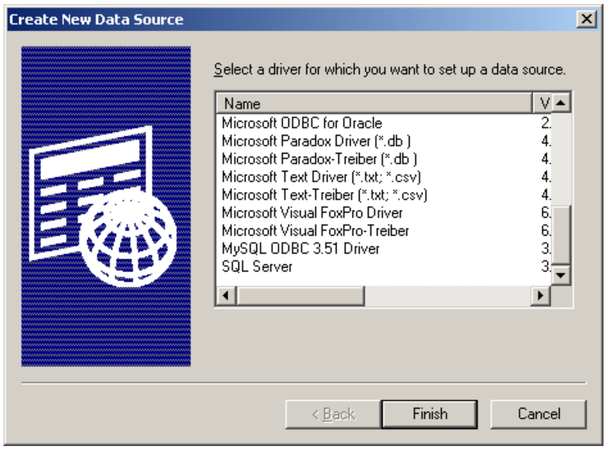
System Data Sources:

Name	Driver
CBA_EH_DB	Microsoft Access Driver (*.mdb)
CBA_TL_DB	Microsoft Access Driver (*.mdb)

An ODBC System data source stores information about how to connect to the indicated data provider. A System data source is visible to all users on this machine, including NT services.

4. Click **Add.**

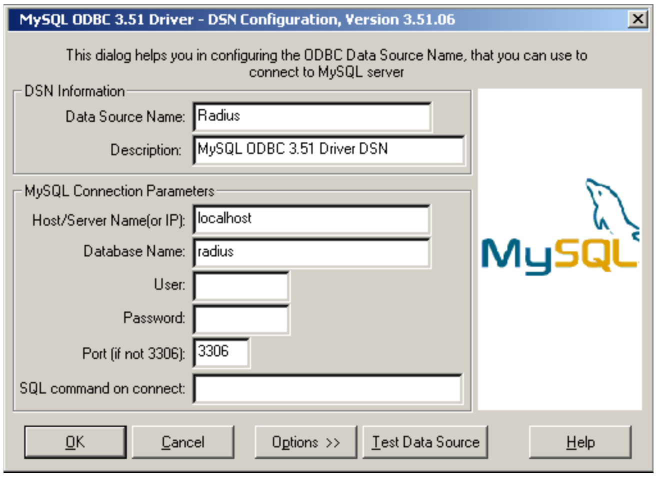
5. Select M**ySQL ODBC 3.51 Driver**, then click **Finish**.



Select a driver for which you want to set up a data source.

Name	V
Microsoft ODBC for Oracle	2.
Microsoft Paradox Driver (*.db)	4.
Microsoft Paradox-Treiber (*.db)	4.
Microsoft Text Driver (*.txt; *.csv)	4.
Microsoft Text-Treiber (*.txt; *.csv)	4.
Microsoft Visual FoxPro Driver	6.
Microsoft Visual FoxPro-Treiber	6.
MySQL ODBC 3.51 Driver	3.
SQL Server	3.

6. Fill in the appropriate fields in the *Driver configuration* window as follows:



MySQL ODBC 3.51 Driver - DSN Configuration, Version 3.51.06

This dialog helps you in configuring the ODBC Data Source Name, that you can use to connect to MySQL server

DSN Information

Data Source Name: Radius

Description: MySQL ODBC 3.51 Driver DSN

MySQL Connection Parameters

Host/Server Name(or IP): localhost

Database Name: radius

User:

Password:

Port (if not 3306): 3306

SQL command on connect:

- Data Source Name: Name of the datasource. For this example, it must be set to **Radius**.
- Host / Server Name (or IP): Location of the datasource. For this example, it must be set to **localhost**.
- Database name: Name of the database. For this example, it must be set to **radius**.

7. Click **OK**.
8. Click **OK**.

phpMyAdmin

1. Extract **phpMyAdmin-2.5.2-pl1-php.zip** into the directory: **c :\OpenSA\Apache\htdocs.**
2. Rename:**\OpenSA\Apache\htdocs\phpMyAdmin-2.5.2-pl1** to **phpMyAdmin.**

Setting the path

To adjust the path, do the following:

1. Right-click **My Computer** on the desktop.
2. Click **Properties**.
3. Click **Advanced**.
4. Click **Environment Variables**.
5. In the **System variables** window, click the **Path** entry, and then click **Edit**.
6. Make sure that the **Variable value** field terminates as follows:

```
;c:\Php;c:\Php\dlls;C:\OpenSA\Apache;C:\OpenSA\OpenSSL\bin;c:\M
ySQL\bin
```

Important: *The order of the entries in this field must be as illustrated above, and no duplicate entries must exist.*

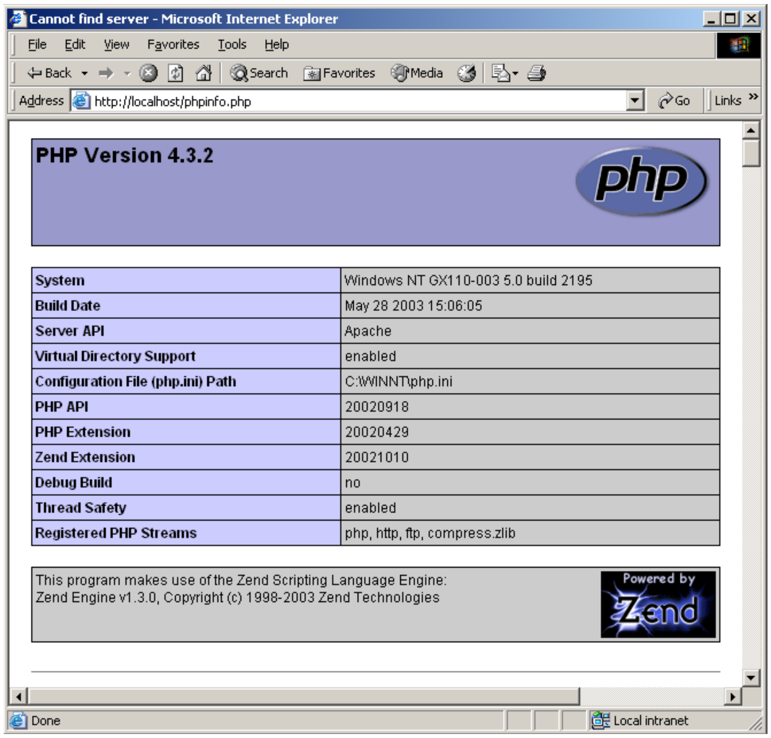
7. Click **OK**, **OK**, **OK**.

Start mysql

1. Run **c:\mysql\bin\winmysqladmin.exe**
2. When prompted to enter a username and password click **Cancel**.
3. Shut down and restart Server 1.

Test PHP

1. Open a command-line session.
2. Run **c:\opensa\apache\apache.exe -D SSL**.
3. Point your web browser to **http://localhost/phpinfo.php.** The following page opens:


Cannot find server - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://localhost/phpinfo.php
Go Links
php
Powered by Zend
Done
Local intranet

PHP Version 4.3.2

System	Windows NT GX110-003 5.0 build 2195
Build Date	May 28 2003 15:06:05
Server API	Apache
Virtual Directory Support	enabled
Configuration File (php.ini) Path	C:\WINNT\php.ini
PHP API	20020918
PHP Extension	20020429
Zend Extension	20021010
Debug Build	no
Thread Safety	enabled
Registered PHP Streams	php, http, ftp, compress.zlib

This program makes use of the Zend Scripting Language Engine:
Zend Engine v1.3.0, Copyright (c) 1998-2003 Zend Technologies

4. Close the command-line session Apache is running in.

Create the sample RADIUS database

A batch file is provided that will automatically create the database entries needed for this example. This saves you the trouble of making these entries manually.

1. Start a windows command-line session.
2. Change to the directory: **c:\colubris\mysql\**
3. Run the batch file: **createdb.cmd**

   For example:

```
mysqladmin: DROP DATABASE radius failed;
error: 'Can't drop database 'radius'. Database doesn't exist'
Database "radius" created
Displaying users present in database
u_username      u_user_type
hotspot 1
user    2
admin   4
www.noc-cn3000.com      1
```

Note: *It is normal to see the following error when the createdb.cmd is run the first time: DROP DATABASE radius failed*

Step 3: Configure Steel-Belted Radius on Server 1

Modify the default configuration files

The backend.zip file contains modified configuration settings for the Steel-Belted Radius server to make it work in this example.

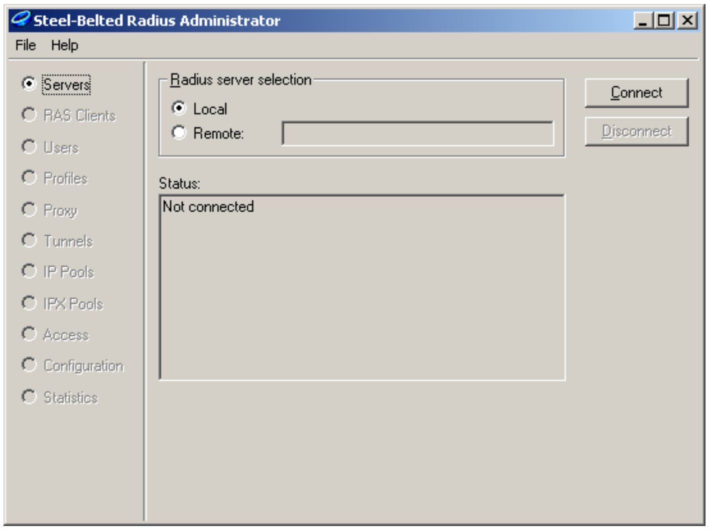
1. Open a command-line session.
2. Execute the command: **net stop "Steel-Belted Radius"**

   This stops the Steel-Belted Radius server. (It was automatically started after installation.)
3. Copy the following files from **c:\colubris\radius\** to **c:\radius\service\.**
   - **Sqlacct.acc**
   - **Sqlacct2.acc**
   - **Sqlauth.aut**

   If you are prompted to replace the files, do so.
4. If you are using an older version of Steel-Belted Radius, you should also copy the files in **c:\colubris\radius\older_version\** to **c:\radius\service\.**

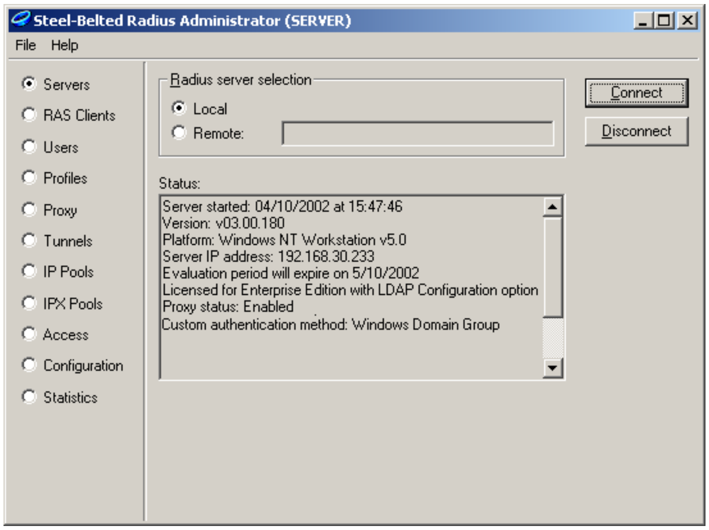
Start and connect to the server

1. Open a command-line session.
2. Execute the command: **net start "Steel-Belted Radius"**
3. On the **Start** menu, click **Steel-Belted Radius**, then click **Steel-Belted Radius Administrator**. The following window opens.



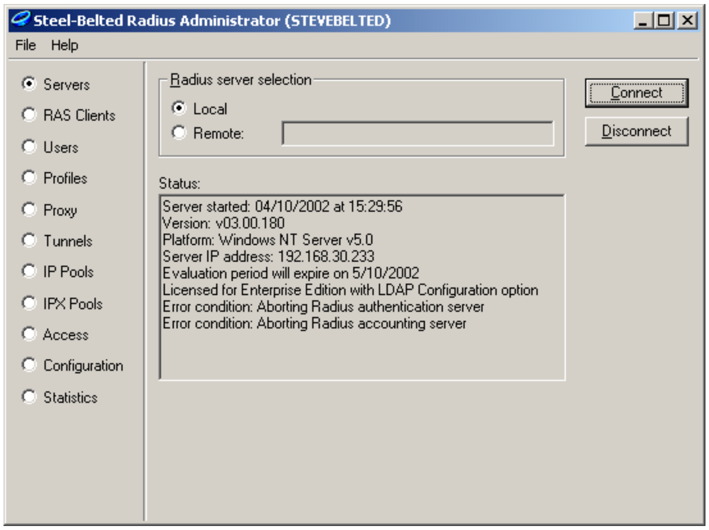
Not connected

4. Click **Connect**. This connects you to the Steel-Belted Radius server.



```
Server started: 04/10/2002 at 15:47:46
Version: v03.00.180
Platform: Windows NT Workstation v5.0
Server IP address: 192.168.30.233
Evaluation period will expire on 5/10/2002
Licensed for Enterprise Edition with LDAP Configuration option
Proxy status: Enabled
Custom authentication method: Windows Domain Group
```

If you see any error messages in the Status window, you must resolve them before continuing. For example:



```
Server started: 04/10/2002 at 15:29:56
Version: v03.00.180
Platform: Windows NT Server v5.0
Server IP address: 192.168.30.233
Evaluation period will expire on 5/10/2002
Licensed for Enterprise Edition with LDAP Configuration option
Error condition: Aborting Radius authentication server
Error condition: Aborting Radius accounting server
```

One common error is to forget to terminate the IAS and IIS services and then reboot. These services will continue to interfere with the Steel-Belted Radius server until you reboot.

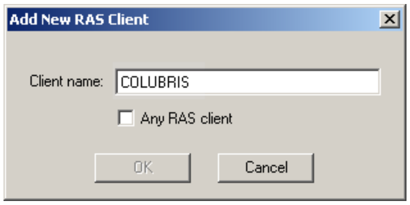
Define a RAS client for the CN3200

Any device that uses the services of a RADIUS server to perform authentication tasks is called a RADIUS client, and must have its own RAS Client settings.

To complete this section you need to know the IP address assigned to the Internet port on the CN3200. For this example, use the address 192.168.2.1.

1. Select **RAS Clients**.
2. Click **Add.**

3. Choose a name for the CN3200. For this example, use the name **COLUBRIS**. This is a nickname that is used by Steel-Belted Radius to identify the client and is not configured on the CN3200.



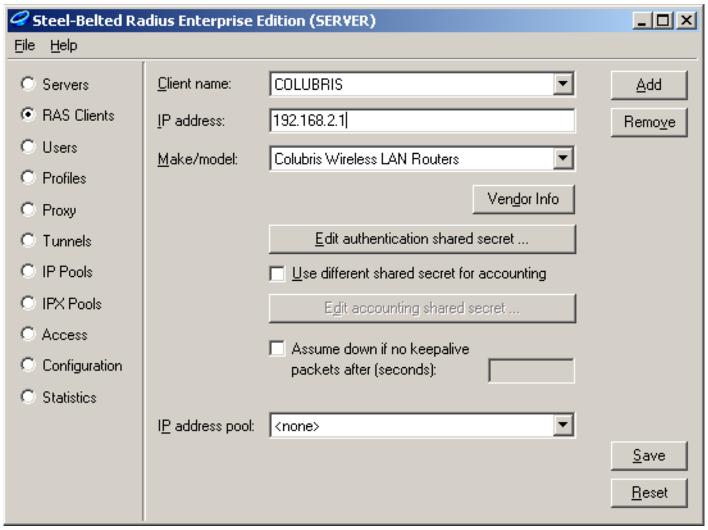
Client name: COLUBRIS

□ Any RAS client

4. Click **OK**.

5. Specify the address of the CN3200's Internet port. For this example, specify 192.168.2.1.

6. Set **Make/model** to **Colubris Wireless LAN Routers.**


Steel-Belted Radius Enterprise Edition (SERVER)
File
Help
Add
Remove
Vendor Info
Edit authentication shared secret ...
Edit accounting shared secret ...
Save
Reset

○ Servers
● RAS Clients
○ Users
○ Profiles
○ Proxy
○ Tunnels
○ IP Pools
○ IPX Pools
○ Access
○ Configuration
○ Statistics

Client name: COLUBRIS

IP address: 192.168.2.1

Make/model: Colubris Wireless LAN Routers

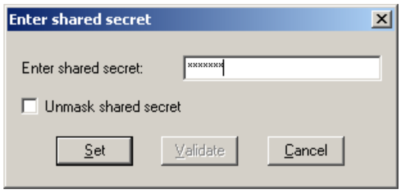
□ Use different shared secret for accounting

□ Assume down if no keepalive packets after (seconds):

IP address pool: <none>

7. Click **Edit authentication shared secret**.

8. Specify a carefully chosen shared secret. In a production environment you should use a combination of at least eight uppercase/lowercase letters as well as digits. For simplicity, this example uses the shared secret: **secret**.



Enter shared secret: ******

□ Unmask shared secret

9. Click **Set**.

10. Click **Save**.

Create RADIUS profiles

RADIUS profiles must be created for each user group that will be authenticated on the public access interface. Rather than enter this information manually, you can import it from the .rif (Radius Interchange Format) files that are included in the archive.

This will create four profiles:

DEMO-DEVICES

This is the profile used by the CN3200.

- login name: hotspot
- password: hotspot

DEMO-USERS

Profile used by customers of the public access network.

- login name: user
- password: user

DEMO-ADMIN

Profile used by administrators who want to login to the management tool on the CN3200.

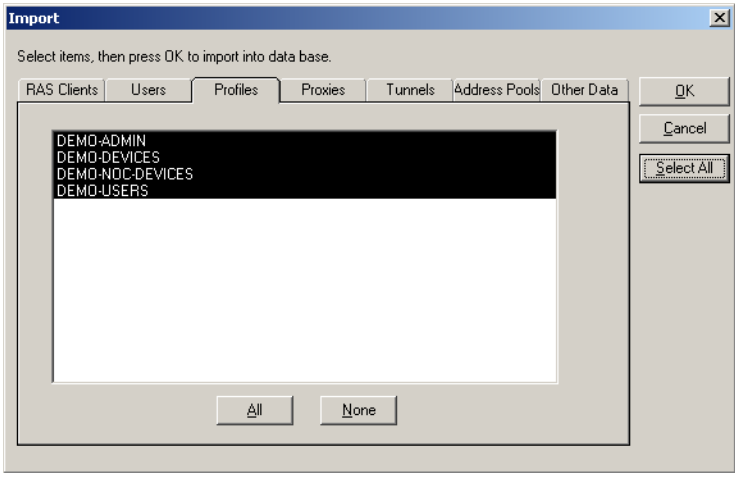
- login name: admin
- password: admin

DEMO-NOC-DEVICES

This is the profile used by the CN3200 when configured for NOC authentication.

- login name: www.noc-cn3000.com
- password: www.noc-cn3000.com

1. On the **File** menu, click **Import**.
2. Select the file **example.rif** in **c:\colubris\radius\**.
3. Click the **Profiles** tab, click **Select All**, then click **OK**.



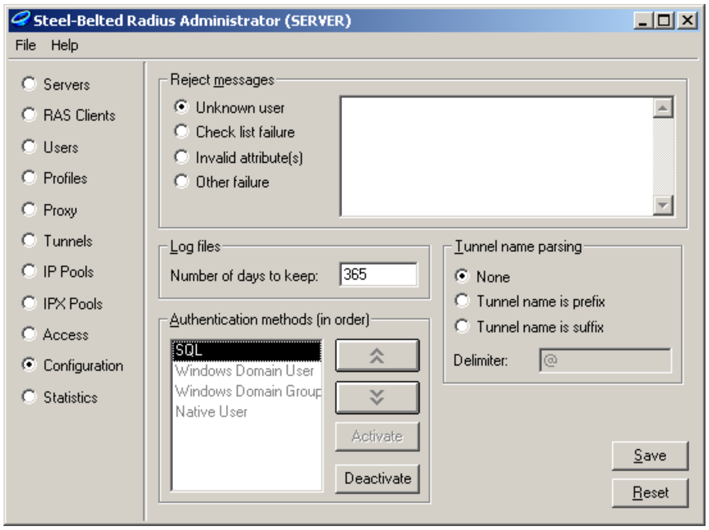
Select items, then press OK to import into data base.

DEMO-ADMIN
DEMO-DEVICES
DEMO-NOC-DEVICES
DEMO-USERS

This returns you to the main screen. Leave this window open and proceed to the next section.

Update the Steel-Belted Radius configuration

1. Return to the Steel-Belted Radius Configurator window.
2. Click **Servers**.
3. Click **Disconnect**.
4. Open a command-line session and execute the command:
   net stop “Steel-Belted Radius”
   net start “Steel-Belted Radius”
5. Return to the Steel-Belted Radius Configurator window.
6. Click **Connect**.
7. Click **Configuration**
8. In the **Authentication methods** box, select **SQL** and click **Activate** (if it is not already active). Deactivate all other authentication methods.



○ Servers
○ RAS Clients
○ Users
○ Profiles
○ Proxy
○ Tunnels
○ IP Pools
○ IPX Pools
○ Access
● Configuration
○ Statistics

Reject messages
● Unknown user
○ Check list failure
○ Invalid attribute(s)
○ Other failure

Log files
Number of days to keep: 365

Tunnel name parsing
● None
○ Tunnel name is prefix
○ Tunnel name is suffix
Delimiter: @

Authentication methods (in order)
SQL
Windows Domain User
Windows Domain Group
Native User

9. Click **Save**.

Step 4: Install web server certificates on Server 1

Certificates enable client station to validate the identity of a web server. Refer to Chapter 14: SSL certificates for complete discussion of certificates and examples on how to create them. You can use the sample provided with this demo in **c:\colubris\certificates** or create your own. Once you have created your certificates install them as explained in this section.

Install the public key certificate

The web server public key certificate will be contained in a password-protected file. To avoid entering the password every time you start the server, you should decrypt the certificate before installing it.

1. Open a command-line session.
2. Go to the directory **c:\colubris\certificates**.
3. Run the command: **decryptkey *certificate* > server.key**

   Replace certificate with the name of the certificate file. If you are using the sample provided, the PEM pass phrase is: www.company.com. For example:

   ```
   C:\colubris\certificates>decryptkey www.company.com >
   server.key
   read RSA key
   Enter PEM pass phrase:
   writing RSA key
   ```

   The unencrypted certificate is written to **server.key**.
4. Copy **server.key** to **c:\OpenSA\Apache\conf\ssl.key\**. Overwrite an existing file if prompted.

Install the private key certificate

The web server public key certificate will be contained in a .pem file.

1. Open a command-line session.
2. Copy the certificate file (.pem) to the file **server.crt**. For example:

   ```
   c:\colubris\certificates>copy www.company.com.pem server.crt
   ```

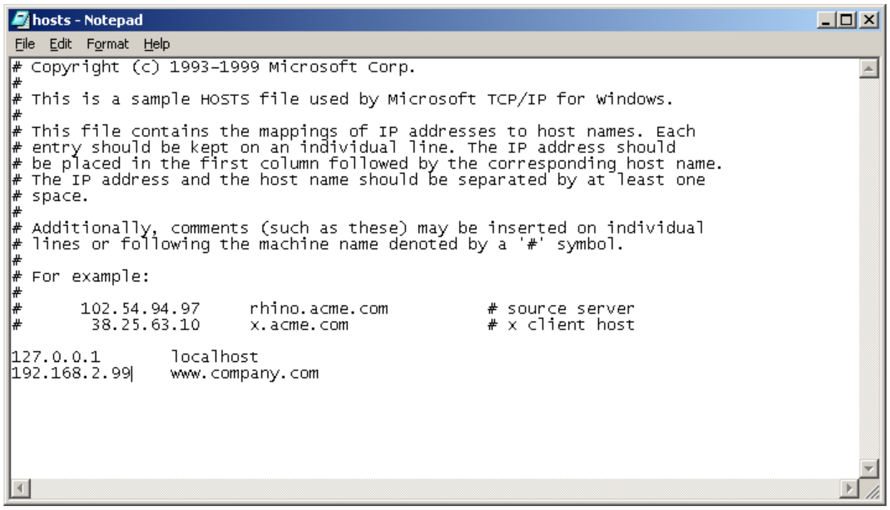
3. Copy **server.crt** to c:**\OpenSA\Apache\conf\ssl.crt\.** Overwrite an existing file if prompted.

Verify the certificates

1. Launch a command-line session.
2. Edit the file **c:\WINNT\system32\drivers\etc\hosts** file and add the following line:

   ```
   192.168.2.99   www.company.com
   ```

   If you generated your own certificate replace **www.company.com** with the name you specified in your certificate.

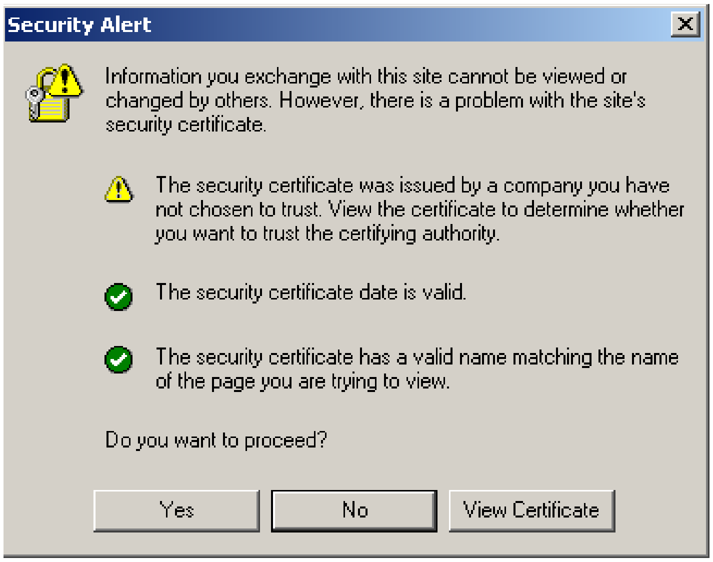


```
# Copyright (c) 1993-1999 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#      102.54.94.97     rhino.acme.com          # source server
#       38.25.63.10     x.acme.com              # x client host

127.0.0.1       localhost
192.168.2.99    www.company.com
```

3. Go to the directory: **`c:\OpenSA\Apache`**
4. Stop the web server with the command: **`apache -k stop`**.
5. Restart the web server in SSL mode with the command: **`apache.exe -D SSL`**
6. Close all active web browsers.
7. Open a new browser window and point it to: **`https://www.company.com`**

   Depending on how you obtained the key, you may see the following message box:



Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.

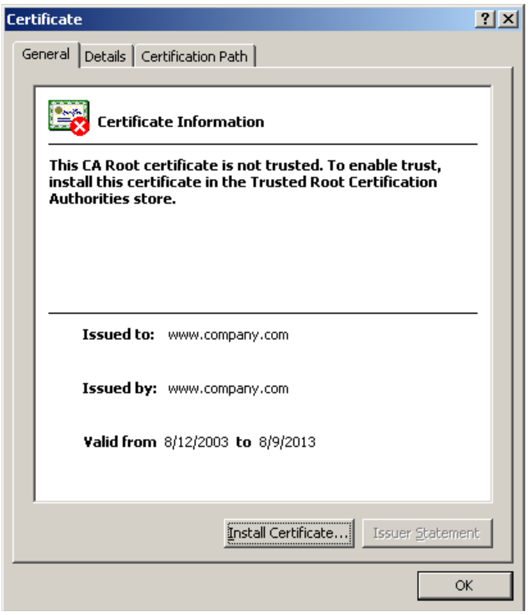
⚠ The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.

✓ The security certificate date is valid.

✓ The security certificate has a valid name matching the name of the page you are trying to view.

Do you want to proceed?

8. Click **View Certificate**. You should see the details of the certificate you just installed. For example:



Certificate Information

This CA Root certificate is not trusted. To enable trust, install this certificate in the Trusted Root Certification Authorities store.

Issued to: www.company.com

Issued by: www.company.com

Valid from 8/12/2003 to 8/9/2013

Step 5: Install and configure the CN3200

Follow the directions in Chapter 4: Installation then continue with the instructions in this section.

Start Apache

Make sure that the Apache web server is running. If not, then:

1. Launch a new command-line session.
2. Run **c:\opensa\apache\apache.exe –D SSL**. This starts Apache in secure mode.

Assign a static address

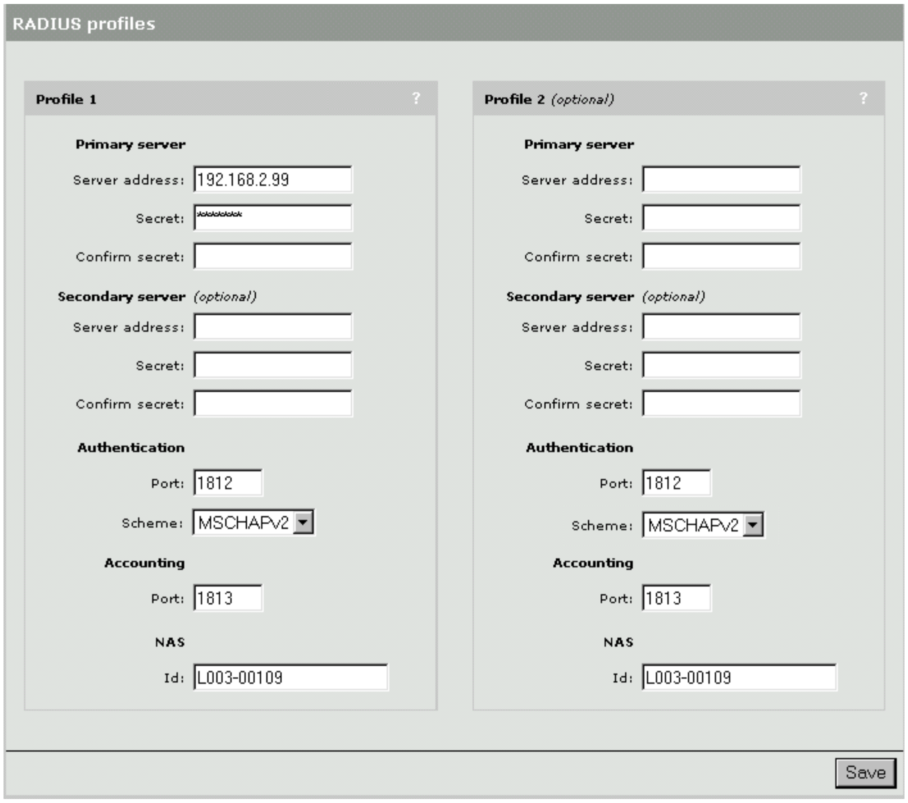
Perform the following steps using the CN3200 Management tool.

1. On the **Network** menu, click **Ports.**
2. Click **Internet port** in the table.
3. Select **Static** and then click **Configure**.
4. Make the following settings:
   - IP address: Assign an address. For this example, use the address: **192.168.2.1**
   - Address mask: Assign an appropriate mask. For this example, use the mask: 255.255.255.0.
   - Default gateway: Leave blank. In a real setup this would be set to the address of the router providing access to the Internet.

Configure RADIUS settings

The CN3200 must be configured to communicate with the Steel-Belted Radius server. For a detailed explanation of configuration issues, see Chapter 16: "Customizing CN3200 and customer settings" on page 207.

1. On the **Security** menu, click **RADIUS**. The *RADIUS settings* page opens.



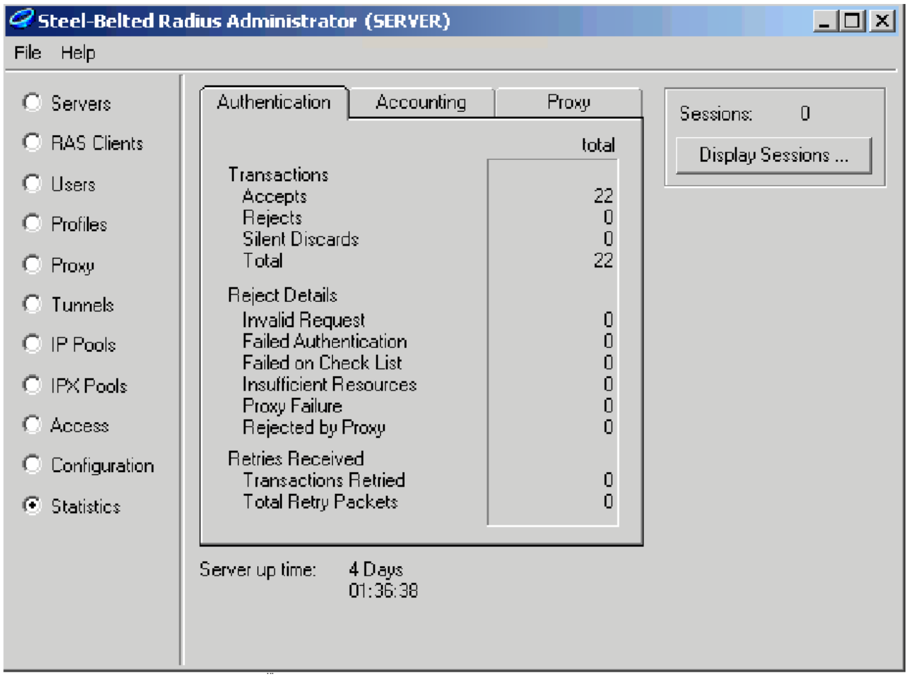
RADIUS profiles

	Profile 1	Profile 2 *(optional)*
Primary server		
Server address:	192.168.2.99	
Secret:	*******	
Confirm secret:		
Secondary server *(optional)*		
Server address:		
Secret:		
Confirm secret:		
Authentication		
Port:	1812	1812
Scheme:	MSCHAPv2	MSCHAPv2
Accounting		
Port:	1813	1813
NAS		
Id:	L003-00109	L003-00109

2. Configure the following parameters:
   - Primary server address: Specify the address of Server 1. For this example, use the address: 192.168.2.99
   - Primary server secret: Specify the secret you defined on when configuring Steel-Belted Radius. For this example, use the secret: **secret**
3. Click **Save**.

4. Click **Authentication**. The *Authentications settings* page opens.
5. In the **Customers** box, set **Authenticate via** to **RADIUS profile 1**.
6. Configure the **CN3200** box as follows:
   - **Authenticate via**: Set to **RADIUS profile 1**.
   - **Login name**: Set to **hotspot**.
   - **Password**: Set to **hotspot**.
7. Enable **Authenticate customers with 802.1x**.
8. Click **Save.** The CN3200 will attempt to connect to the Steel-Belted Radius server. If successful, the status light will change from red to green.

   You can use the *Statistics* page on the Steel-Belted Radius Administrator to view progress of the connection.



Sessions: 0

	total
Transactions	
Accepts	22
Rejects	0
Silent Discards	0
Total	22
Reject Details	
Invalid Request	0
Failed Authentication	0
Failed on Check List	0
Insufficient Resources	0
Proxy Failure	0
Rejected by Proxy	0
Retries Received	
Transactions Retried	0
Total Retry Packets	0

Server up time: 4 Days 01:36:38

When you click the **Save** button in the management tool, the number of **Accepts** should be incremented. That means that all settings are properly configured on the CN3200 and Steel-Belted Radius.

If the number of **Rejects** is incremented instead, there may be a problem with a badly set username and/or password. Check the log file in **c:\radius\service**. It is named **yyyymmdd.log**, where **yyyy** is the year, **mm** is the month and **dd** the day. For example, **20030822.log** for August 22, 2003.

If the number of **Silent Discards** is incremented, it probably means that either the IP address of the CN3200 and/or the shared secret has not been properly configured on the RAS client tab.

You can increase the amount of information in the log file by changing the following values in the **c:\radius\service\radius.ini** file, and restarting Steel-Belted Radius:

```
[Configuration]
LogLevel                    = 0
TraceLevel                  = 0
```

Change both values from 0 to 2.

Certificates

You can replace the certificate that is installed on the CN3200 with your own to eliminate the warning message clients see when they try to login to the public access interface. Refer to Chapter 14: SSL certificates for complete discussion of certificates and examples on how to create and install them.

Important: *Do not install the same certificate as the one installed on your web server. You need to use a valid signed certificate to remove the warning*

Step 6: Install and configure software on Server 2

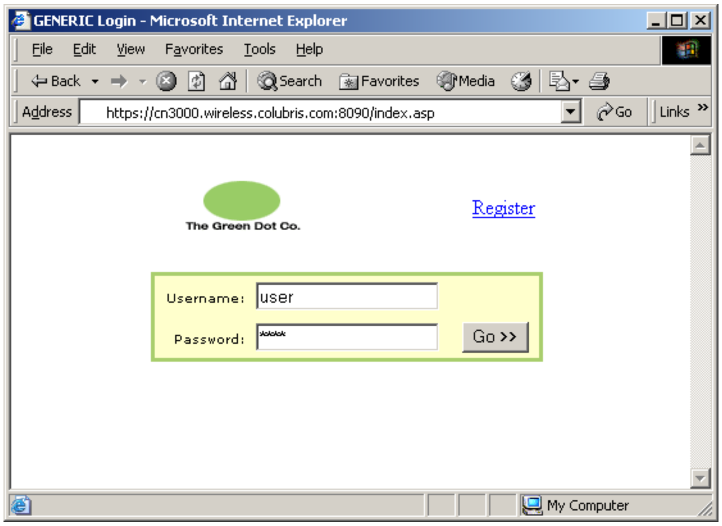
Server 2 will be used to test if the customer is successfully redirected to the originally requested page.

1. Install Windows 2000 Professional, Server, or Advanced Server, and then install Service Pack 3.
2. Make sure that IIS is running.
3. Connect Server 2 to the hub and assign a static IP address to it. For this example, use the address 192.168.2.100.

Step 7: Test the installation

To test the installation you will use the client station to log onto the public access interface. For this to work, the CN3200 must be configured as the clients default gateway. If you set up your equipment to match the setup of this example, this is automatic. If not, adjust the configuration of the client accordingly.

1. Start the client station's web browser and enter the IP address (or domain name) of Server 2.
2. The CN3200 should intercept the URL and redirect the browser to the login page. You should see the modified login page shown below. (Depending on the type of certificate you installed on the CN3200 you may see a security warning first.)



GENERIC Login - Microsoft Internet Explorer

Address: https://cn3000.wireless.colubris.com:8090/index.asp

Register

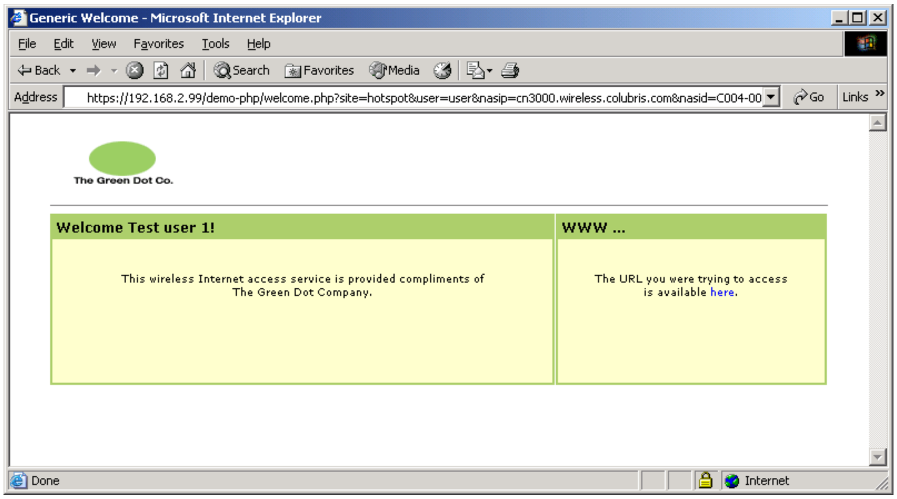
Username: user

Password: ****

If you see the default login page (Register does not appear), it means that the CN3200 could not retrieve the URLs for the modified pages. Click **Tools** in the management tool and examine the messages in the log file to fix the error.

The register button shows how to register an unauthenticated customer using a remote, secure web page.

3. To login, specify **user** as both the username and password.
4. Once you have been authenticated, the welcome page should open.



Generic Welcome - Microsoft Internet Explorer

Address: https://192.168.2.99/demo-php/welcome.php?site=hotspot&user=user&nasip=cn3000.wireless.colubris.com&nasid=C004-00

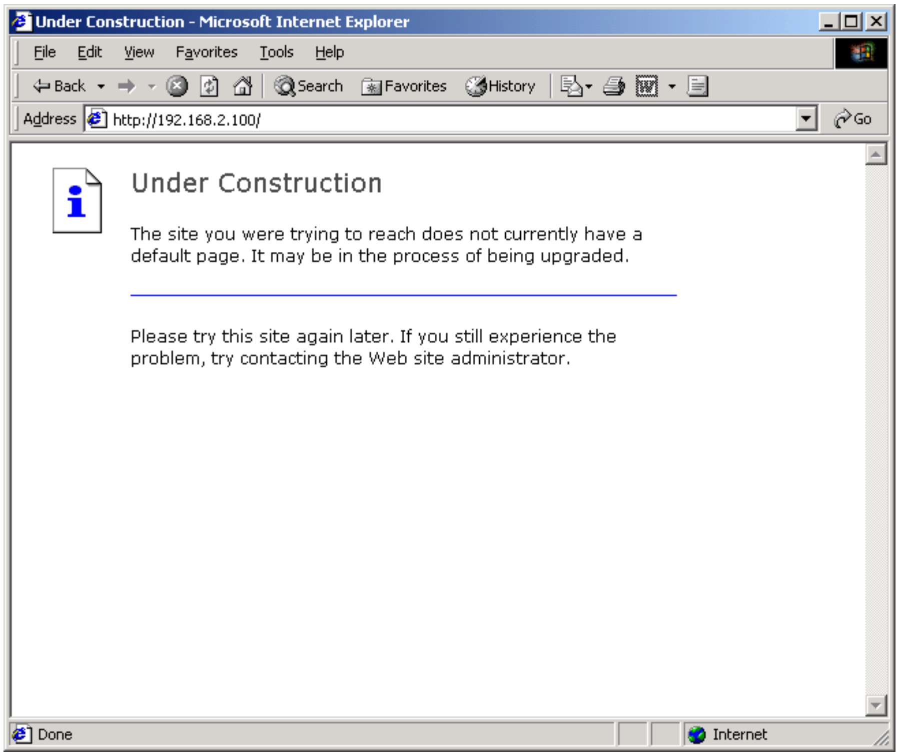
Welcome Test user 1!

This wireless Internet access service is provided compliments of The Green Dot Company.

WWW ...

The URL you were trying to access is available here.

5. Click the link. You will be redirected to the web server on Server 2.


Under Construction - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://192.168.2.100/
Go
Done
Internet

Under Construction

The site you were trying to reach does not currently have a default page. It may be in the process of being upgraded.

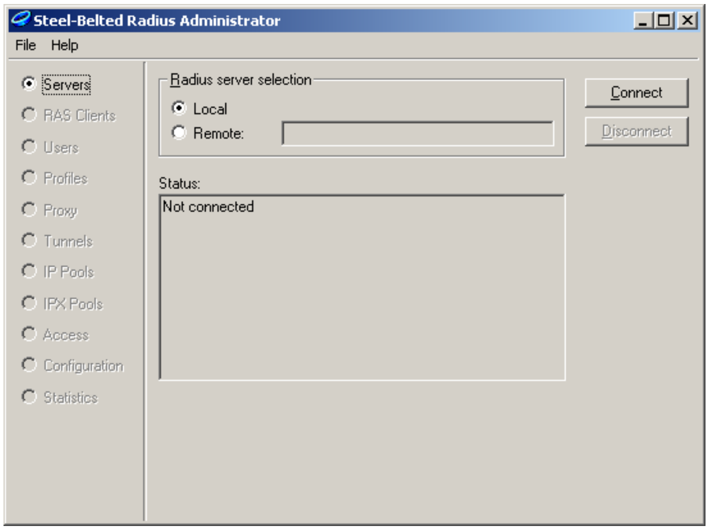
Please try this site again later. If you still experience the problem, try contacting the Web site administrator.

Step 8: Test the remote login page feature

The sample files you installed on Server 1 also include definitions to allow testing of the remote login page feature. This feature enables the CN3200 to redirect customers to a remote URL to login instead of using the internal login page. For more information see “Using a remote login page” on page 173.

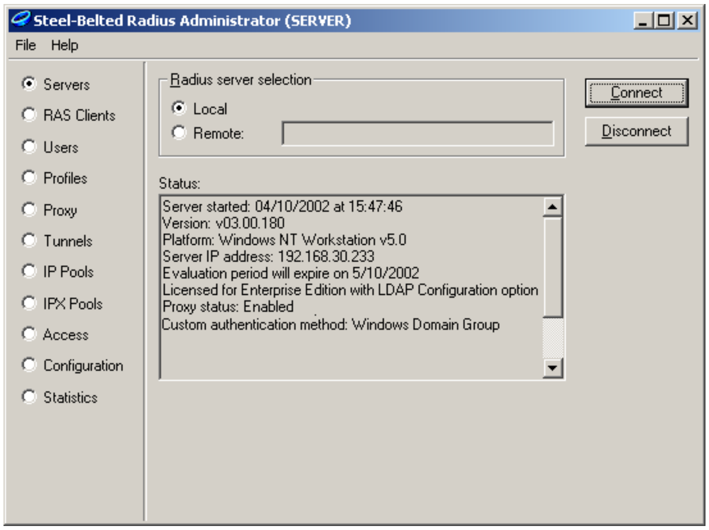
Enable the remote login feature

1. On the **Start** menu, click **Steel-Belted Radius**, then click **Steel-Belted Radius Administrator**. The following window opens.



```
Not connected
```

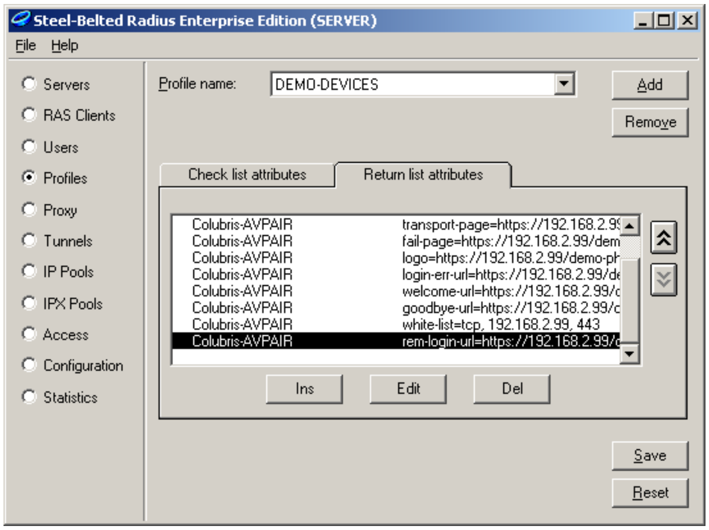
2. Click **Connect**. This connects you to the Steel-Belted Radius server.



```
Server started: 04/10/2002 at 15:47:46
Version: v03.00.180
Platform: Windows NT Workstation v5.0
Server IP address: 192.168.30.233
Evaluation period will expire on 5/10/2002
Licensed for Enterprise Edition with LDAP Configuration option
Proxy status: Enabled
Custom authentication method: Windows Domain Group
```

3. Click **Profiles**.

4. Select **DEMO-DEVICES**.



Profile name: DEMO-DEVICES

Colubris-AVPAIR	transport-page=https://192.168.2.9
Colubris-AVPAIR	fail-page=https://192.168.2.99/dem
Colubris-AVPAIR	logo=https://192.168.2.99/demo-ph
Colubris-AVPAIR	login-err-url=https://192.168.2.99/de
Colubris-AVPAIR	welcome-url=https://192.168.2.99/c
Colubris-AVPAIR	goodbye-url=https://192.168.2.99/c
Colubris-AVPAIR	white-list=tcp, 192.168.2.99, 443
Colubris-AVPAIR	rem-login-url=https://192.168.2.99/c

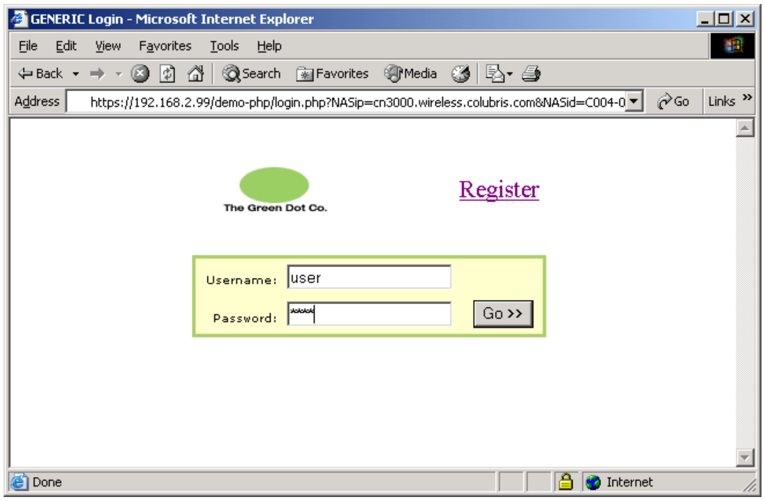
5. Click the **Return list attributes** tab and remove the **rem-** in front of **rem-login-url**:

```
login-url=https://192.168.2.99/demo-php/
login.php?NASip=%i&NASid=%n&original_url=%o
```

6. This overrides the setting for the **login-page =** entry in the RADIUS profile. However, it is good practice to remove the login-page entry.
7. Click **OK**.
8. Click **Save**.
9. Open the CN3200's management tool and go to the **Security > Authentication** page.
10. Click **Force Authenticate**.
11. Wait about 1 minute before continuing to let the CN3200 download the change

Test the remote login feature

1. Start the client station's web browser and enter the IP address (or domain name) of Server 2.
2. The CN3200 should intercept the URL and redirect the browser to the remote login page on 192.168.2.99. (Depending on the type of certificate you installed on the CN3200 you may see a security warning first.)



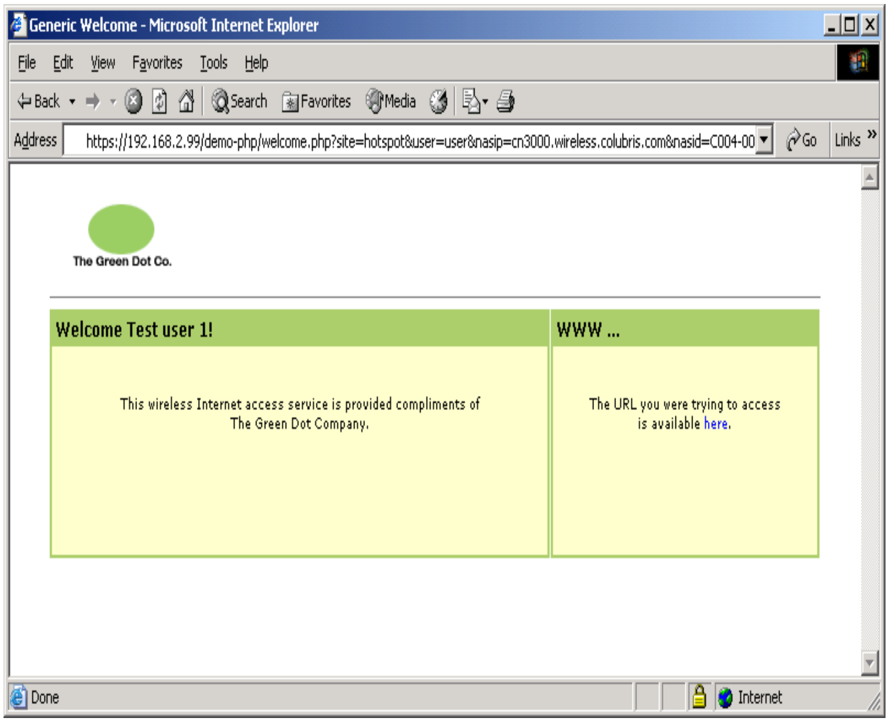
Address https://192.168.2.99/demo-php/login.php?NASip=cn3000.wireless.colubris.com&NASid=C004-0

Username: user

Password: ****

The register button shows how to register an unauthenticated customer using a remote, secure web page.

3. To login, specify **user** as both the username and password. The Welcome page should open.


Generic Welcome - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address
https://192.168.2.99/demo-php/welcome.php?site=hotspot&user=user&nasip=cn3000.wireless.colubris.com&nasid=C004-00
Go
Links
The Green Dot Co.
Done
Internet

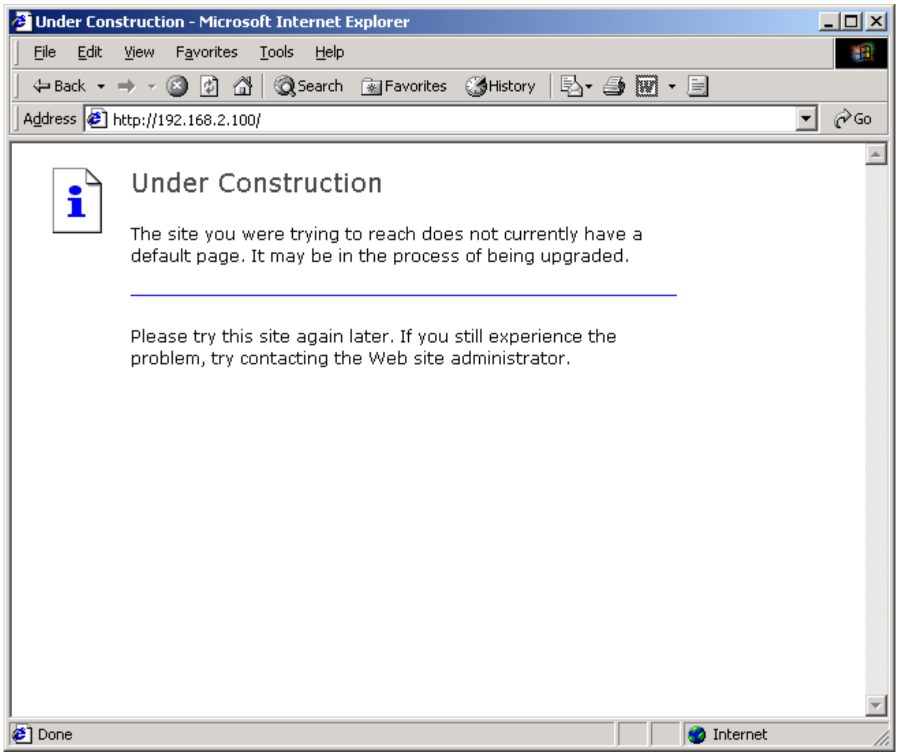
Welcome Test user 1!

This wireless Internet access service is provided compliments of The Green Dot Company.

WWW ...

The URL you were trying to access is available here.

4. Click the link. You should be redirected to the web server on Server 2.


Under Construction - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address
http://192.168.2.100/
Go
Done
Internet

Under Construction

The site you were trying to reach does not currently have a default page. It may be in the process of being upgraded.

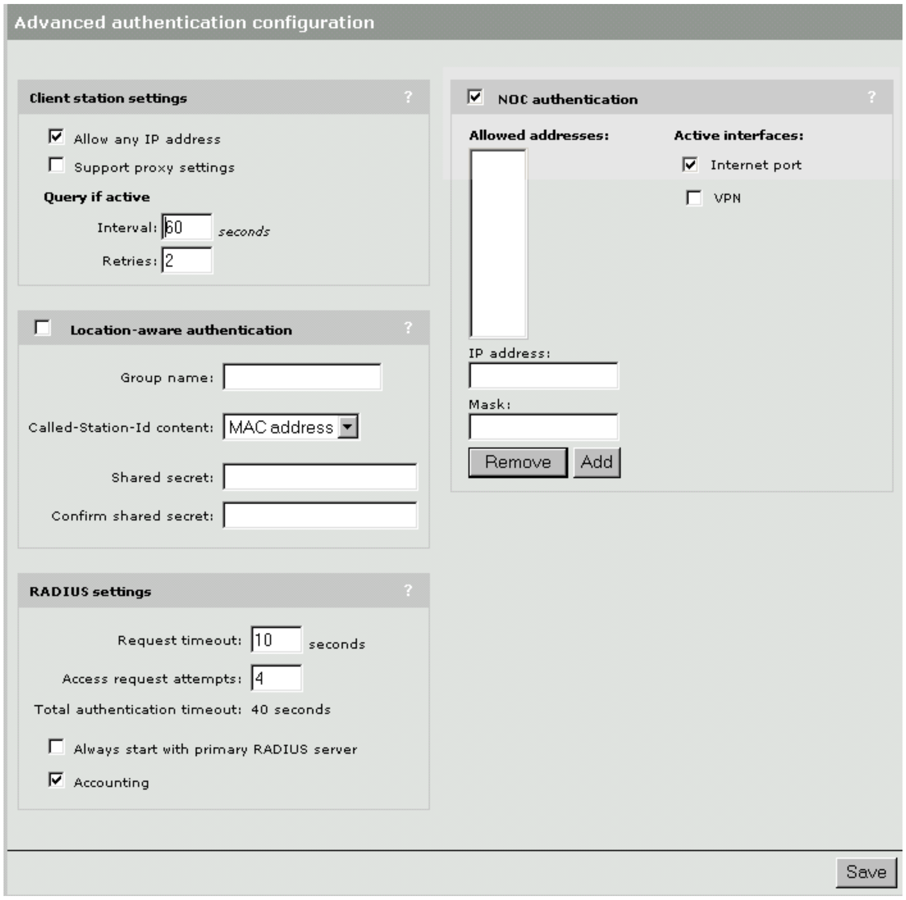
Please try this site again later. If you still experience the problem, try contacting the Web site administrator.

Step 9: Test the NOC authentication feature

The sample files you installed on Server 1 also include definitions that enable you to test the NOC authentication feature. This feature allows you to validate customer logins using a remote server instead of using the CN3200. See page 176 for a description of this feature and its benefits.

Enable NOC authentication

1. Open the CN3200's management tool.
2. On the **Security** menu, click **Authentication,** then click the **Advanced Settings** button.



Advanced authentication configuration

Client station settings

☑ Allow any IP address
□ Support proxy settings

Query if active

Interval: 60 *seconds*
Retries: 2

□ Location-aware authentication

Group name:
Called-Station-Id content: MAC address
Shared secret:
Confirm shared secret:

RADIUS settings

Request timeout: 10 seconds
Access request attempts: 4
Total authentication timeout: 40 seconds

□ Always start with primary RADIUS server
☑ Accounting

☑ NOC authentication

Allowed addresses:

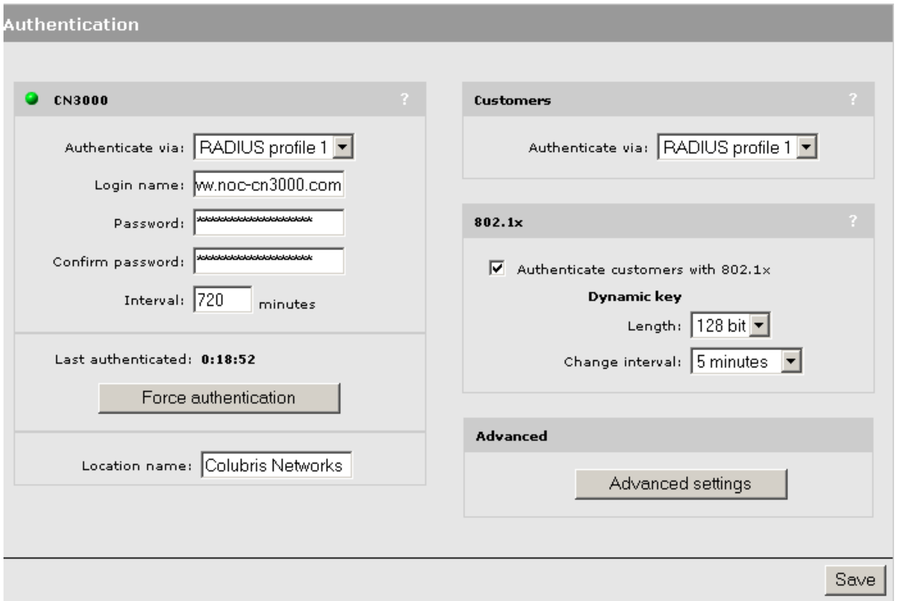
IP address:
Mask:

Active interfaces:

☑ Internet port
□ VPN

3. Enable **NOC Authentication**.
4. Select the **Internet Port** as the **Active Interface**.
5. Click **Save**.

6. On the **Security** menu, click **Authentication**.



Authentication

CN3000

Authenticate via: RADIUS profile 1

Login name: ww.noc-cn3000.com

Password: ******************

Confirm password: ******************

Interval: 720 minutes

Last authenticated: 0:18:52

Location name: Colubris Networks

Customers

Authenticate via: RADIUS profile 1

802.1x

☑ Authenticate customers with 802.1x

Dynamic key

Length: 128 bit

Change interval: 5 minutes

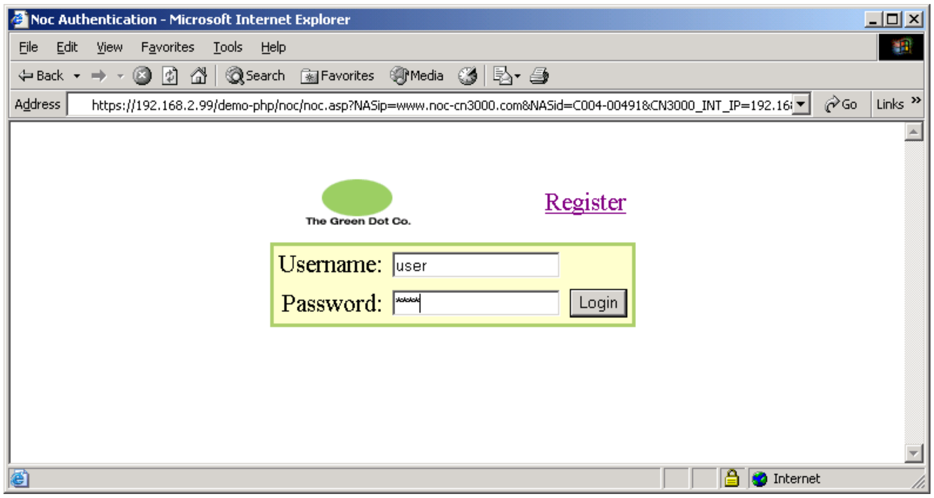
Advanced

7. Specify **www.noc-cn3000.com** for **Login name** and **Password**.
8. Click **Save**.
9. Wait about 1 minute for the CN3200 to download the changes.

Test NOC authentication

1. Start the client station's web browser and enter the IP address (or domain name) of Server 2.
2. The CN3000 should intercept the URL and redirect the browser to the remote NOC login page on 192.168.2.99.

   (Depending on the type of certificate you installed on Server 2 you may see a security warning first.)



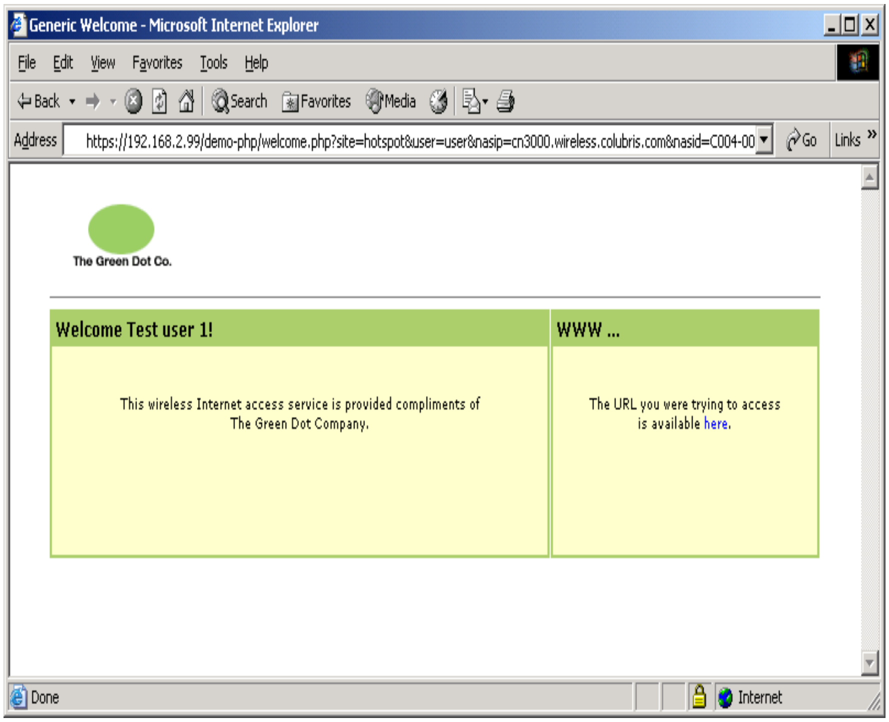
Noc Authentication - Microsoft Internet Explorer

Address https://192.168.2.99/demo-php/noc/noc.asp?NASip=www.noc-cn3000.com&NASid=C004-00491&CN3000_INT_IP=192.16

Username: user

Password: ****

3. To login, specify **user** as both the username and password. The Welcome page should open.


Generic Welcome - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address
Go Links
Done
Internet

https://192.168.2.99/demo-php/welcome.php?site=hotspot&user=user&nasip=cn3000.wireless.colubris.com&nasid=C004-00

The Green Dot Co.

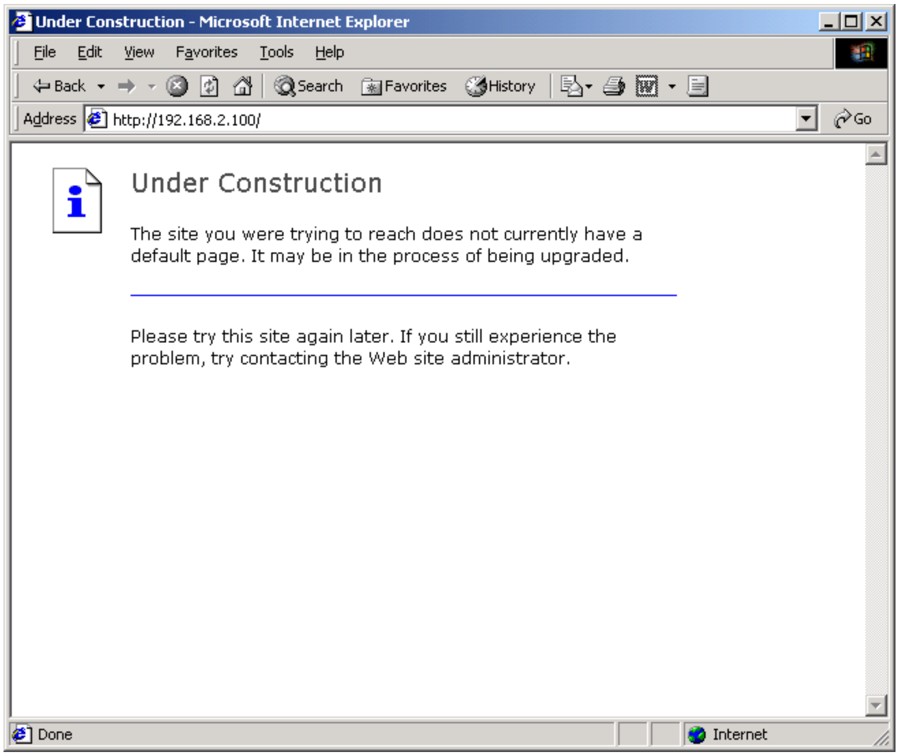
Welcome Test user 1!

This wireless Internet access service is provided compliments of The Green Dot Company.

WWW ...

The URL you were trying to access is available here.

4. Click the link. You should be redirected to the web server on Server 2.


Under Construction - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address
Go
Done
Internet

http://192.168.2.100/

Under Construction

The site you were trying to reach does not currently have a default page. It may be in the process of being upgraded.

Please try this site again later. If you still experience the problem, try contacting the Web site administrator.

Tools

Batch files

Several batch files are included in **c:\colubris\scripts** to make management of the web server, MySQL database, and Steel-Belted Radius easier when using a command-line session. To use this files place them into a directory that appears in your path.

Apache

```
apache-start.cmd
apache-ssl-start.cmd
apache-stop.cmd
apache-restart.cmd
```

If you installed OpenSA in a different location than **c:\**, edit the scripts and change the value of the **`APACHEDIR`** variable to your installation directory.

Mysql

```
mysql-start.cmd
mysql-stop.cmd
mysql-restart.cmd
```

Steel-Belted Radius

```
radius-start.cmd
radius-stop.cmd
radius-restart.cmd
```

Starting services

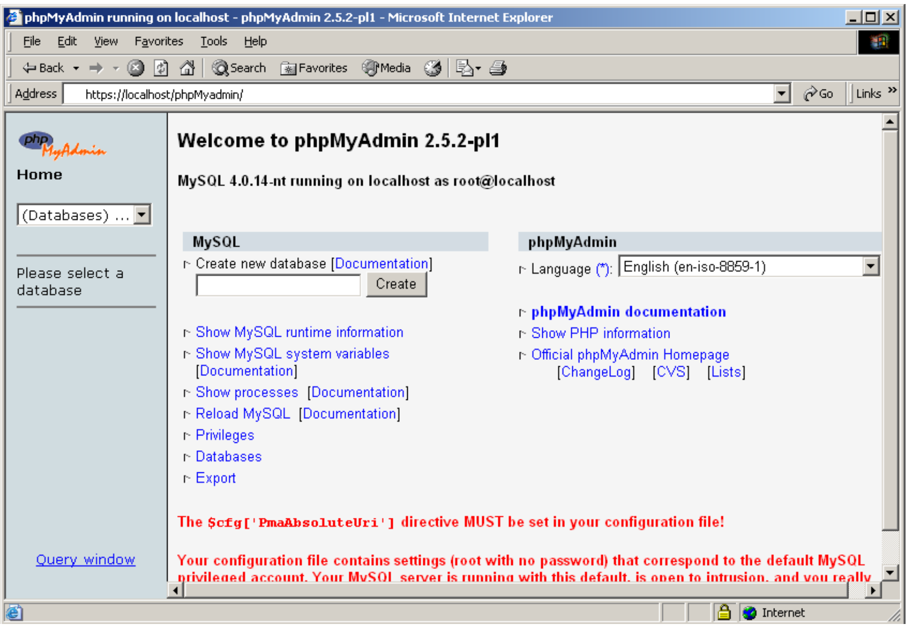
```
mysql-restart.cmd
apache-restart.cmd
radius-restart.cmd
```

phpMyadmin

phpMyadmin provides an easy-to-use interface to the MySQL database. You can use this interface to add or edit user accounts. The following is a quick overview.

1. Point your web browser to: **`https://localhost/phpMyAdmin`**

   The following screen opens:



phpMyAdmin running on localhost - phpMyAdmin 2.5.2-pl1 - Microsoft Internet Explorer

Address https://localhost/phpMyadmin/

Welcome to phpMyAdmin 2.5.2-pl1

MySQL 4.0.14-nt running on localhost as root@localhost

MySQL

- Create new database [Documentation]
- Show MySQL runtime information
- Show MySQL system variables [Documentation]
- Show processes [Documentation]
- Reload MySQL [Documentation]
- Privileges
- Databases
- Export

phpMyAdmin

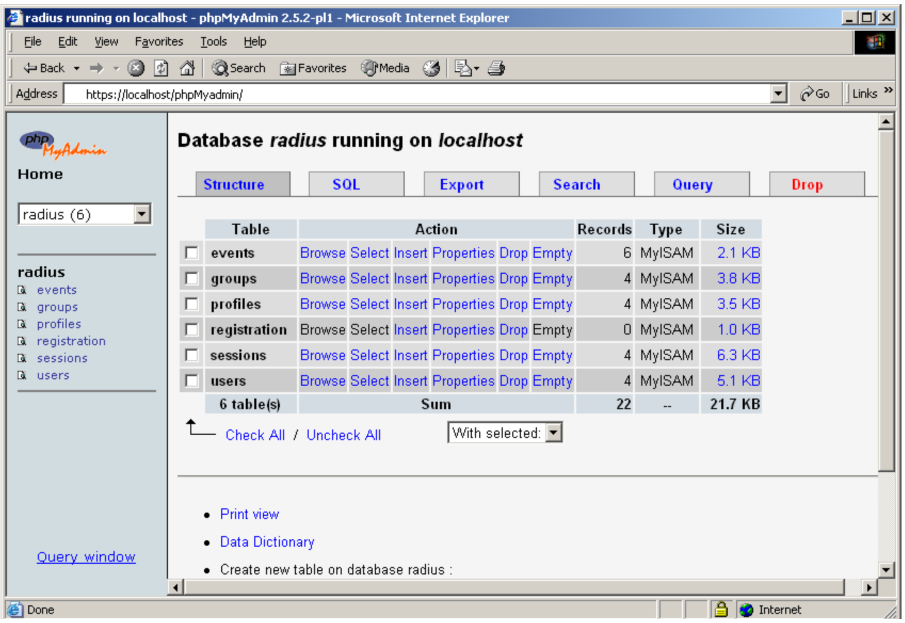
- Language (*): English (en-iso-8859-1)
- phpMyAdmin documentation
- Show PHP information
- Official phpMyAdmin Homepage [ChangeLog] [CVS] [Lists]

The $cfg['PmaAbsoluteUri'] directive MUST be set in your configuration file!

Your configuration file contains settings (root with no password) that correspond to the default MySQL privileged account. Your MySQL server is running with this default, is open to intrusion, and you really

Please select a database

2. Select **radius** in the column on the left side of the page.


radius running on localhost - phpMyAdmin 2.5.2-pl1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://localhost/phpMyadmin/
Go Links
phpMyAdmin
Home
radius (6)
radius
events
groups
profiles
registration
sessions
users
Query window
Structure SQL Export Search Query Drop
Done
Internet

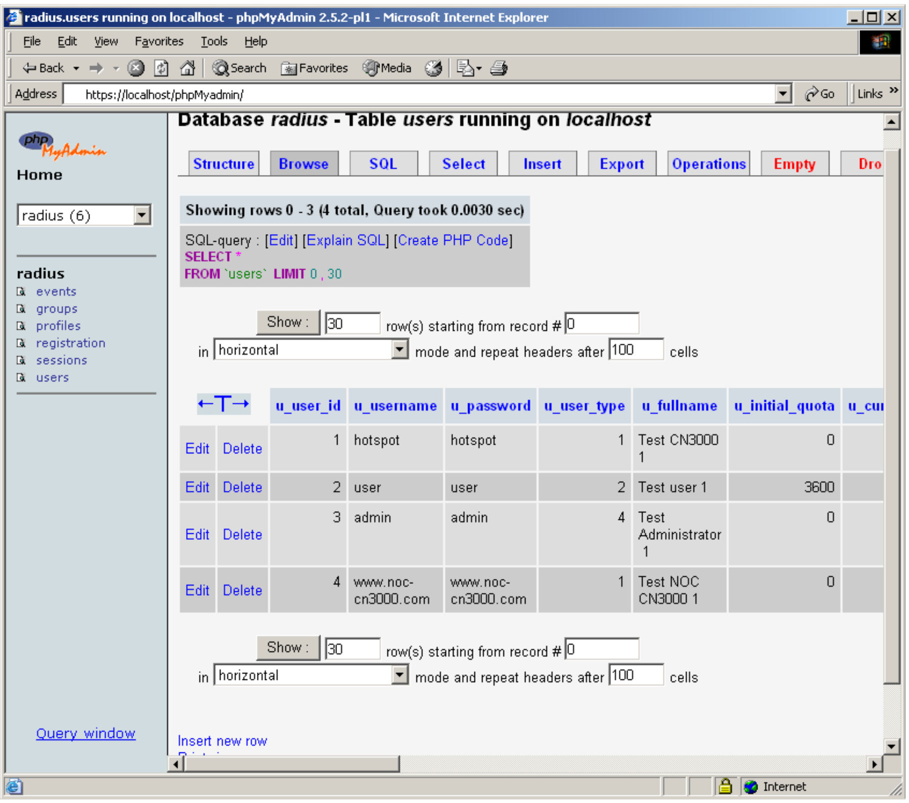
Database *radius* running on *localhost*

	Table	Action	Records	Type	Size
☐	events	Browse Select Insert Properties Drop Empty	6	MyISAM	2.1 KB
☐	groups	Browse Select Insert Properties Drop Empty	4	MyISAM	3.8 KB
☐	profiles	Browse Select Insert Properties Drop Empty	4	MyISAM	3.5 KB
☐	registration	Browse Select Insert Properties Drop Empty	0	MyISAM	1.0 KB
☐	sessions	Browse Select Insert Properties Drop Empty	4	MyISAM	6.3 KB
☐	users	Browse Select Insert Properties Drop Empty	4	MyISAM	5.1 KB
	6 table(s)	Sum	22	--	21.7 KB

Check All / Uncheck All With selected:

- Print view
- Data Dictionary
- Create new table on database radius :

3. Click **users** on the left and then click the **Browse** tab.


radius.users running on localhost - phpMyAdmin 2.5.2-pl1 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://localhost/phpMyadmin/
Go Links
phpMyAdmin
Home
radius (6)
radius
events
groups
profiles
registration
sessions
users
Query window
Structure Browse SQL Select Insert Export Operations Empty Dro
Internet

Database *radius* - Table *users* running on *localhost*

Showing rows 0 - 3 (4 total, Query took 0.0030 sec)

SQL-query : [Edit] [Explain SQL] [Create PHP Code]

```
SELECT *
FROM `users` LIMIT 0 , 30
```

Show : 30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100 cells

←T→		u_user_id	u_username	u_password	u_user_type	u_fullname	u_initial_quota	u_cu
Edit	Delete	1	hotspot	hotspot	1	Test CN3000 1	0	
Edit	Delete	2	user	user	2	Test user 1	3600	
Edit	Delete	3	admin	admin	4	Test Administrator 1	0	
Edit	Delete	4	www.noc-cn3000.com	www.noc-cn3000.com	1	Test NOC CN3000 1	0	

Show : 30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100 cells

Insert new row

- By clicking **Edit**, you can modify the information for an existing user.
- You can add a new user by clicking:
  - **Insert new row**, and fill in all the parameters, or
  - **Edit** an existing user, modify its parameters, then choose **Insert as new row** and click the **Go** button. Note that in this case, you should clear the field **u_user_id**, since this is a primary key for the **user** table. Duplicates are not allowed for this field.

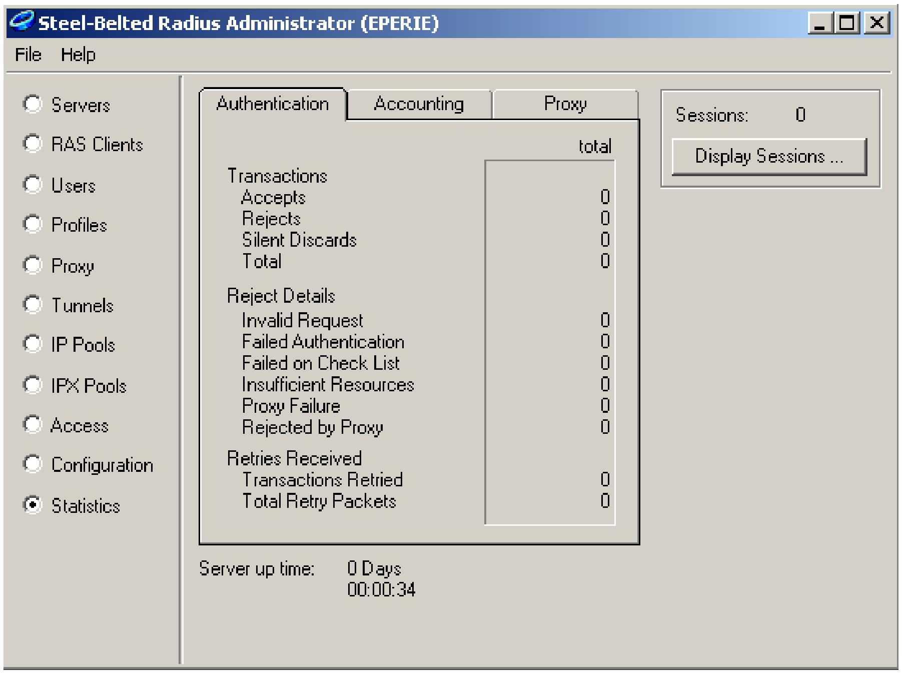
Troubleshooting

The CN3200’s authentication system is not up.

1. The IP address for the RADIUS server may be incorrect: check that a RADIUS server has been configured in the CN3200’s **Security > RADIUS** configuration panel, and that the RADIUS server is reachable from the CN3200.

   One way to do this is to ping its IP address using **Tools > Ping**. If the ping fails, verify the connection between the CN3200 and the RADIUS server.

2. Check that the RADIUS server is receiving authentication requests from the CN3200. Launch the Steel-Belted Radius administrator, connect to the server, and go to **Statistics**.



```
Sessions:     0

                                        total
Transactions
   Accepts                                  0
   Rejects                                  0
   Silent Discards                          0
   Total                                    0
Reject Details
   Invalid Request                          0
   Failed Authentication                    0
   Failed on Check List                     0
   Insufficient Resources                   0
   Proxy Failure                            0
   Rejected by Proxy                        0
Retries Received
   Transactions Retried                     0
   Total Retry Packets                      0

Server up time:     0 Days
                    00:00:34
```

- If the total number of **Transactions** is 0, the CN3200 is not properly connected to the server, either directly or through other networking devices.
- If the number of **Silent Discards** is non-zero, it means the CN3200 and the server have a different shared secret. They should always be the same.
- If the number of **Rejects** is non-zero, it means the CN3200 is using an invalid login name/password pair.
- If the number of **Accepts** is non-zero, it means the positive answer from the server is not being received by the CN3200. There may be routing problems between the CN3200 and the RADIUS server.

There is a timeout while the customer is being redirected to the login page.

In the case, the URL displayed in the address field of the customer’s web browser is of the form: **https://dnsname:8090/index.asp**, it means the CN3200 has been able to perform a DNS reverse-lookup, but the customer’s computer is not able to resolve the resulting name.

There is probably something wrong with the configuration of the DNS for the entry related to the CN3200.

After logout, the goodbye page cannot be displayed

Check that the IP address and port number for the web server hosting the goodbye page is defined in the access list for the RADIUS profile for the CN3200.

Chapter 18

Sample setup - Steel-Belted Radius

This chapter provides a walkthrough of a sample RADIUS configuration using Steel-Belted Radius.

The CN3200 is compliant with RFC 2865 and RFC 2866 and will work with a variety of RADIUS servers. This example is for illustrative purposes only and does not imply that you need to use Steel-Belted Radius over any other brand.

IMPORTANT: Before reading this chapter you should familiarize yourself with the concepts discussed in in Chapter 15 and Chapter 16.

Overview

This sample will be constructed using a fully-functional evaluation version of Steel Belted Radius Server from Funk Software that will be installed on a computer running Windows NT 4.0 or Windows 2000.

The difference between this sample and the backend example in Chapter 18, is as follows:

- This example illustrates how to manually configure profiles on the Steel-Belted Radius server. In the backend sample they are automatically created using predefined scripts.
- The backend sample uses an OBDC database to store profile properties. In this example, all properties are stored in Steel-Belted Radius. Dynamic tracking of usage and accounting information is only possible when using an OBDC database, therefore this example is best suited to installations that require user authentication only.

Prerequisites

Software

- Windows 2000 Professional, Server, or Advanced Server (with Service Pack 3), and all recommended updates
- Steel Belted Radius Server version 4 from Funk Software
- Internet Explorer 6.0 service pack 1, and all recommended updates

Hardware

- a network hub
- a second network hub or a cross-over cable
- two computers capable of running Windows 2000 Professional, Server or Advanced Server
- a CN3200
- a third computer with a JavaScript-enabled web browser, with or standard Ethernet adapter

Skills

- Familiarity with the installation and operation of TCP/IP-based networks.
- Basic knowledge of Windows 2000, including how to use a Windows command-line session.

Equipment setup

This section illustrates the hardware setup that was used to create the sample configuration described in this chapter. If you duplicate this setup, you will not have to change any of the IP addresses supplied in the example.

Topology

The goal of this setup is to simulate a working environment with the least amount of equipment. To this end, the 'public network' is considered to be any device connected to the LAN port on the CN3200. The 'protected network resources' are connected to the Internet port on the CN3200. In this example, both Server 1 and Server 2 are on the protected network. Server 1 hosts the RADIUS server. Server 2 is used to simulate an external web server.

See "Wiring details" on page 358 *for information on how to build a x-over cable.*

To test the setup when installation and configuration is complete, you will use the client station to browse the web server installed on Server 2. The CN3200 will intercept the request and display public access login page. Your login information will be validated using the the Funk Steel Belted Radius Server installed on Server 1. After you are authenticated, the CN3200 will display the welcome page. This page will contain the URL of the originally requested web server (Server 2). You can then click the URL to reach Server 2.

About the components

Server 1

Server 1 hosts the Funk Steel Belted Radius Server.

Server 2

Server 2 is required to test the setup once it is complete. You should install a web server on this computer. This example uses IIS running on Windows 2000 professional.

Client station

The client station is required to test the setup once it is complete. It requires a web browser. The DHCP server on the CN3200 will assign an IP address to this computer.

Step 1: Install software on Server 1

Windows 2000

1. Install Windows 2000 Professional, Server, or Advanced Server and then install Service Pack 3. Make sure you also install all recommended updates.
2. Disable the **IAS** and **IIS** services on Windows 2000 Server, or Advanced Server. This is required to avoid conflicts with Steel-Belted Radius and Apache.
3. Connect Server 1 to the hub and assign a static IP address to it. For this example, use the address 192.168.2.99.
4. Shut down and restart Server 1.

Steel-Belted Radius

1. Retrieve **Funk Steel Belted Radius Server v4 Evaluation version**, from funk.com.
2. Run the executable installation file and accept all default installation settings. When prompted, select the 30 day trial.

Important

If you encounter the following error message when trying to start the Steel-Belted Radius NT Service:

```
Services:  Error 1068:  The dependency service or group failed to
start.
```

Refer to Tech Note RD230 on the Funk web site for a solution.

Internet Explorer

Install Internet Explorer 6 SP1 on the server. The support files included with this application are required for proper operation.

Step 1: Add support for Colubris Networks attributes

Note: *If you do not want to modify the files yourself, modified versions are available in the Colubris Backend archive which can be found on the CD or on the Colubris Networks web site.*

Do the following on server 1:

1. Create an file named **colubris.dct** in the folder: **c:\radius\service**
2. Edit the file so that it contains the following entries.

   ```
   @radius.dct
   ATTRIBUTE Colubris-AVPAIR 26 [vid=8744 type1=0 len1=+2 data=string] RO
   ```

   For more information on the format of this file, see **c:\radius\service\readme.dct**.
3. Edit **c:\radius\service\dictiona.dcm**. Add the following line to the end of this file, just after the last line beginning with an '@'.

   ```
   @colubris.dct
   ```
4. Edit **c:\radius\service\vendor.ini**. Add the following lines to the end of the file.

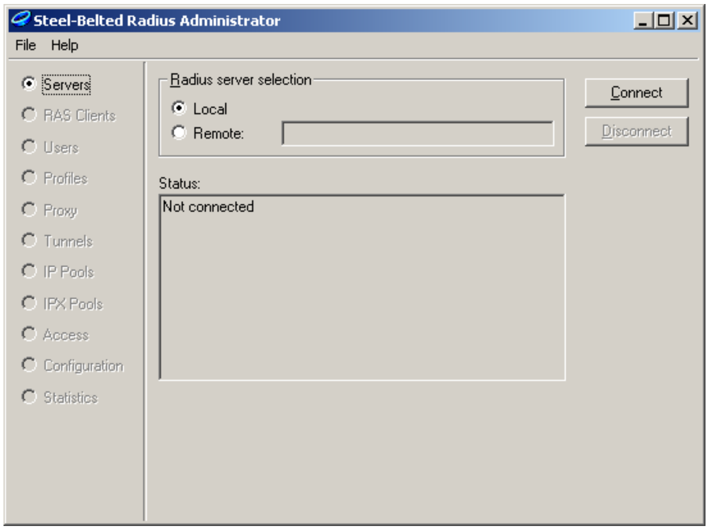
   ```
   vendor-product        = Colubris CN3200
   dictionary            = Colubris
   ignore-ports          = no
   port-number-usage     = per-port-type
   help-id               = 0
   ```
5. Restart Steel-Belted Radius. For example, start a command line session and then issue the commands:

   ```
   net stop "Steel-Belted RADIUS"
   net start "Steel-Belted RADIUS"
   ```

Step 2: Connect to the Steel-Belted Radius server

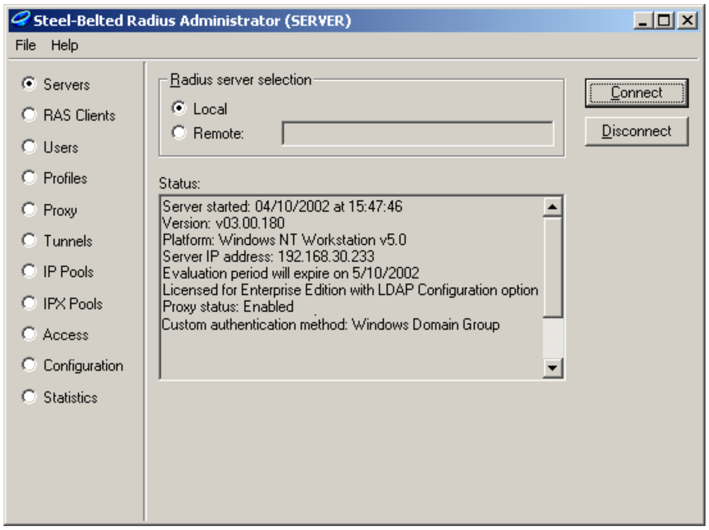
Do the following on server 1:

1. On the **Start** menu, click **Steel-Belted Radius**, then click **Steel-Belted Radius Administrator**. The following window opens.



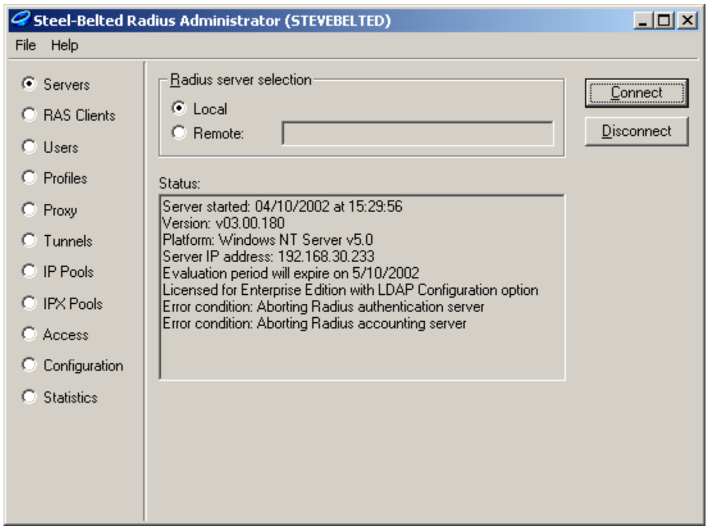
Not connected

2. Click **Connect**. This connects you to the Steel-Belted Radius server.



```
Server started: 04/10/2002 at 15:47:46
Version: v03.00.180
Platform: Windows NT Workstation v5.0
Server IP address: 192.168.30.233
Evaluation period will expire on 5/10/2002
Licensed for Enterprise Edition with LDAP Configuration option
Proxy status: Enabled
Custom authentication method: Windows Domain Group
```

If you see any error messages in the Status window, you must resolve them before continuing. For example:



```
Server started: 04/10/2002 at 15:29:56
Version: v03.00.180
Platform: Windows NT Server v5.0
Server IP address: 192.168.30.233
Evaluation period will expire on 5/10/2002
Licensed for Enterprise Edition with LDAP Configuration option
Error condition: Aborting Radius authentication server
Error condition: Aborting Radius accounting server
```

A common cause for these errors is to forget to terminate the IAS and IIS services and then reboot. These services will continue to interfere with the Steel-Belted Radius server until you stop and terminate them, then reboot.

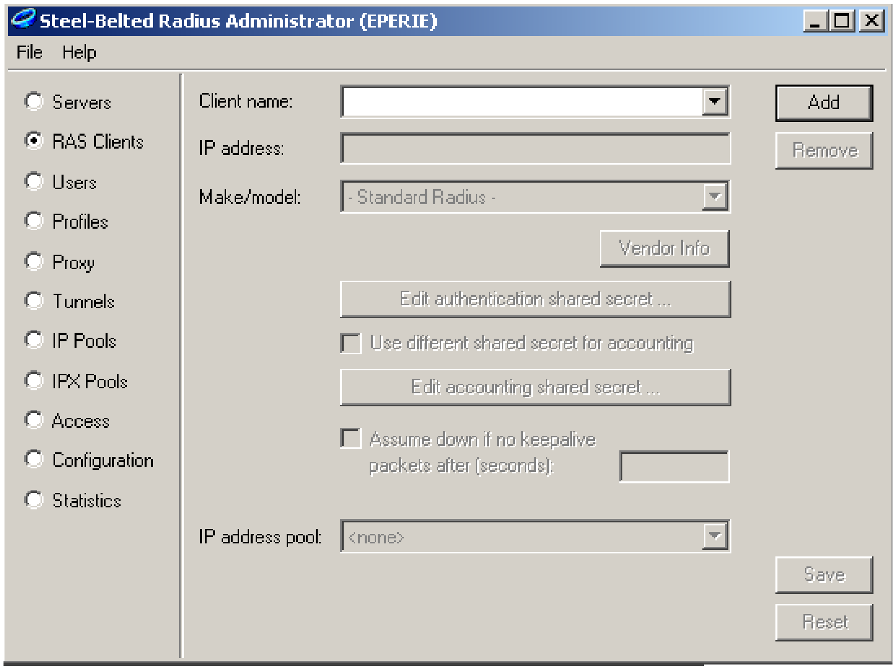
Step 3: Create a RADIUS client profile for the CN3200

Any device that uses the services of a RADIUS server to perform authentication tasks is called a RADIUS client, and must have its own RAS Client profile. Therefore, you must create a profile for the CN3200.

To complete this section you need to know the IP address assigned to the Internet port on the CN3200. For this example, use the address 192.168.2.1.

Note: *The configuration settings you make here will match the settings you make on the CN3200 later.*

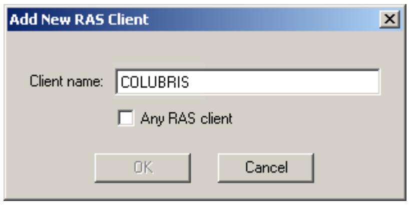
1. Select **RAS Clients**.


Steel-Belted Radius Administrator (EPERIE)
File
Help
○ Servers
● RAS Clients
○ Users
○ Profiles
○ Proxy
○ Tunnels
○ IP Pools
○ IPX Pools
○ Access
○ Configuration
○ Statistics
Client name:
IP address:
Make/model:
Vendor Info
Edit authentication shared secret ...
□ Use different shared secret for accounting
Edit accounting shared secret ...
□ Assume down if no keepalive packets after (seconds):
IP address pool:
Add
Remove
Save
Reset

Make/model: - Standard Radius -

IP address pool: <none>

2. Click **Add.**
3. Choose a name for the CN3200. For this example, use the name **COLUBRIS**. This is a nickname that is used by Steel-Belted Radius to identify the client and is not configured on the CN3200.

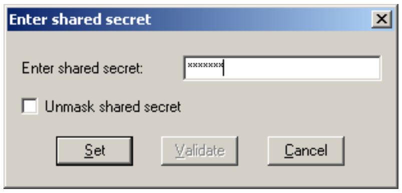


Client name: COLUBRIS

□ Any RAS client

4. Click **OK**.
5. Specify the address of the CN3200's Internet port. For this example, specify 192.168.2.1.

6. Set **Make/model** to **Colubris CN3200**.
7. Click **Edit authentication shared secret**.
8. Specify a carefully chosen shared secret. In a production environment you should use a combination of at least eight uppercase/lowercase letters as well as digits. For simplicity, this example uses the shared secret: **secret**.



Enter shared secret: *******

□ Unmask shared secret

9. Click **Set**.
10. Click **Save**.

Step 4: Define RADIUS profiles

RADIUS profiles are used to manage and control all authentication tasks. Each profile contains two sets of attributes:

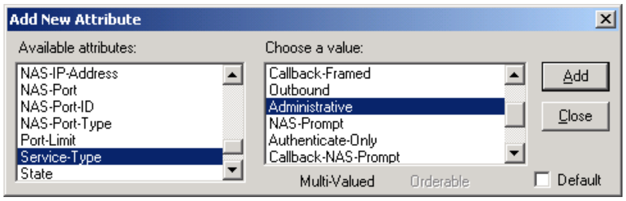
- Check list attributes: These attributes must be contained in the user's authentication request for the authentication to be successful.
- Return list attributes: These attributes are returned once authentication is successful.

For this example you will create a RADIUS profile for:

- the CN3200
- Public access customers subscribing to SMTP redirection
- Public access customers not subscribing to SMTP redirection
- CN3200 administrators

Defining a CN3200 profile

1. Click **Profiles**.
2. Click **Add**.
3. Specify a name for the profile. For this example, use the name **HOTSPOTS**. Click **OK**.
4. Click the **Check list attributes** tab.
5. Click the **Ins** button. The *Add New Attribute* dialog box opens.

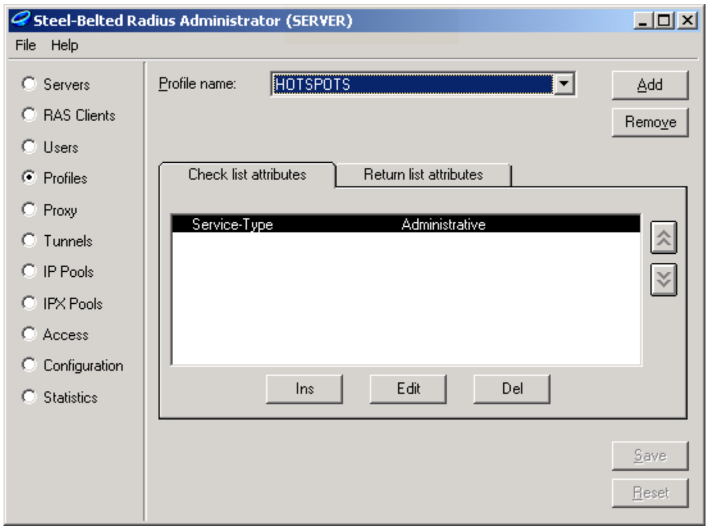


Add New Attribute

Available attributes: NAS-IP-Address, NAS-Port, NAS-Port-ID, NAS-Port-Type, Port-Limit, Service-Type (selected), State

Choose a value: Callback-Framed, Outbound, Administrative (selected), NAS-Prompt, Authenticate-Only, Callback-NAS-Prompt

6. Select **Service-Type** and set it to the value **Administrative**. Click **Add**.



Steel-Belted Radius Administrator (SERVER)

Profile name: HOTSPOTS

Check list attributes:

Service-Type	Administrative

7. Click **Close**.

8. Click the **Returned list attributes** tab.

   You can now specify the attributes that will be returned to the CN3200 after it is successfully authenticated. This enables you to define a number of important operating characteristics, including:

   - The location of custom HTML pages that must be downloaded by the CN3200.
   - One or more access lists for specifying the set of network resources customers have access to.

   For this example, you should create the following three entries:

   A
   ```
   colubris-AVPair   access-list=all,ACCEPT,tcp,192.168.2.99,80
   ```
   This access list permits all users on the public network to access the web server at 192.168.2.99. The typical role of such a server would be to display information about the public access network: how to get an account, how to login, etc.

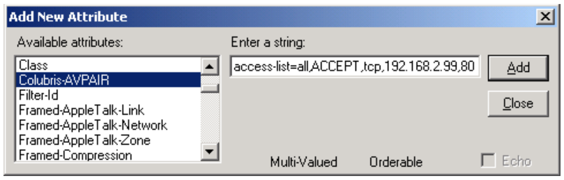
   B
   ```
   Colubris-AVPair   access-list=cust,ACCEPT,tcp,192.168.2.100,80
   ```
   This access list permits only authenticated customers to access the web server at 192.168.2.100.

   C
   ```
   Colubris-AVPair   use-access-list=all
   ```
   This activates the access list **all** for the HOTSPOTS profile. The **cust** access list will be activated in the CUSTOMERS-NO-SMTP and CUSTOMERS-SMTP-REDIRECT profiles.

   (Refer to “Creating a profile for the CN3200 on the RADIUS server” on page 214 for a complete list of all supported attributes.)

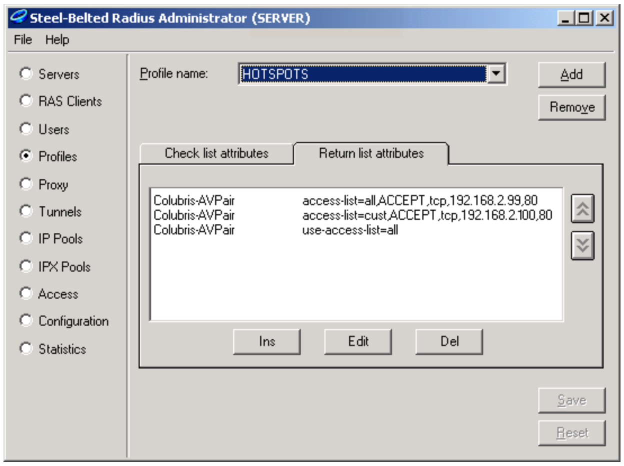
   To add each entry:

   - Click **Ins.** Select **Colubris-AVPair** and enter the appropriate string. For example:



access-list=all,ACCEPT,tcp,192.168.2.99,80

   - Once all entries are complete, the **Return list attributes** tab should look like this:



Profile name: HOTSPOTS

Colubris-AVPair	access-list=all,ACCEPT,tcp,192.168.2.99,80
Colubris-AVPair	access-list=cust,ACCEPT,tcp,192.168.2.100,80
Colubris-AVPair	use-access-list=all

- Click **Save.**

Defining a Customer profile

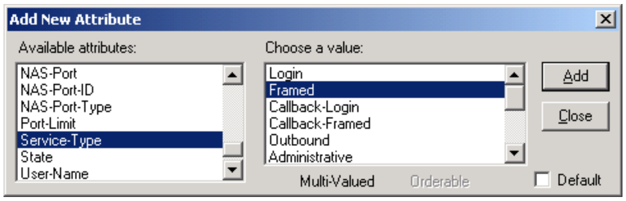
The CN3200 supports an SMTP redirection feature which enables customers to send outgoing mail without being directly connected to their SMTP server.

To use this feature, the customer profiles need to be split into two types: those with SMTP redirection and those without it. To this end, this example will create two profiles: **CUSTOMERS-SMTP-REDIRECT** and **CUSTOMERS-NO-SMTP.**

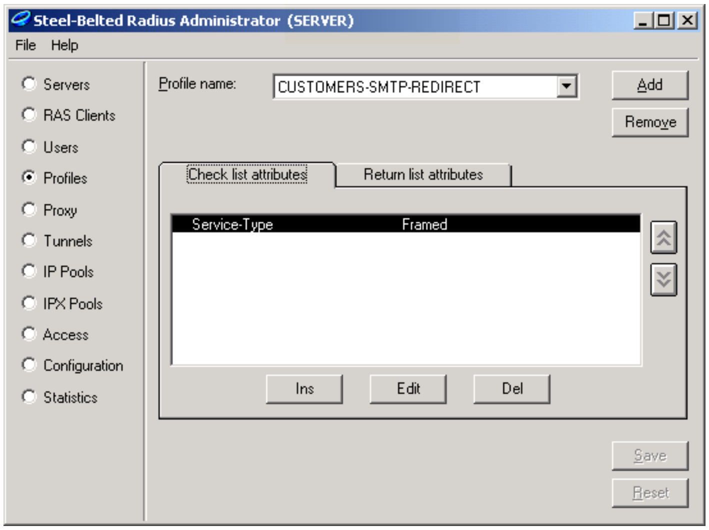
Note: *This example assumes the SMTP server is located on Server 2, although no such software is actually installed.*

To define the customer profiles, do the following:

1. Click **Profiles**.
2. Click **Add**. The *Add New Profile* dialog box opens.
3. Specify **CUSTOMERS-NO-SMTP** as the name and click **OK**.
4. Click **Add**.
5. Specify **CUSTOMERS-SMTP-REDIRECT** as the name and click **OK**.
6. Click the **Check list attributes** tab.
7. Click the **Ins** button. The *Add New Attribute* dialog box opens.



8. Select **Service-Type** and set it to the value **Framed**. Click **Add**.
9. Click **Done**.



● Profiles

Profile name: CUSTOMERS-SMTP-REDIRECT

Service-Type	Framed

10. Click the **Returned list attributes** tab.

You can now specify the attributes that will be returned after a customer is successfully authenticated. This enables you to define a number of important operating characteristics, including:

- The access list that is in use.
- Support for SMTP mail redirection.
- Settings for session timeouts and accounting updates.

For this example, you should create the following four entries:

A `Idle-Timeout    30`

This causes the CN3200 to log the customer out if the session is idle for more than 30 seconds

B `Session-Timeout    360`

This causes the CN3200 to log the customer out if the session is active for more than 360 seconds.

C `Colubris-AVPair   smtp-redirect=192.168.2.100`

This provides access to the fictional SMTP server on 192.168.2.100. Used for the **CUSTOMERS-SMTP-REDIRECT** profile only.

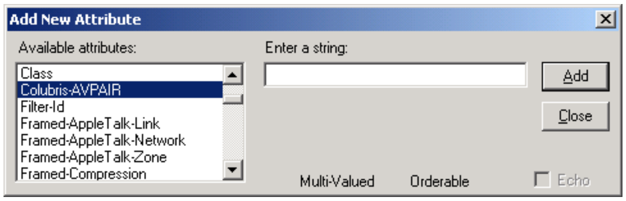
D `Colubris-AVPair   use-access-list=cust`

This access list was defined in the HOTSPOTS profile. It is activated here to provide access to the web server on 192.168.2.100.

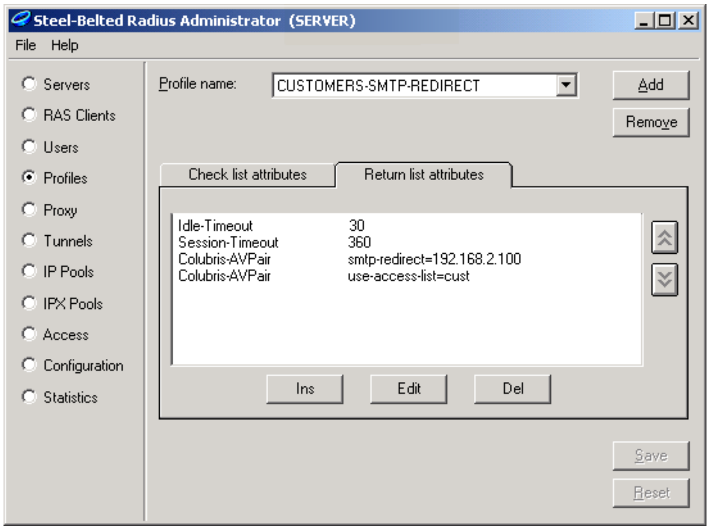
(Refer to “Creating a profile for the CN3200 on the RADIUS server” on page 214 for a complete list of all supported attributes.)

To create the entries:

- Click **Ins**. The *Add New Attribute* dialog box opens.



- Select **Colubris-AVPAIR** and enter the appropriate string.
- Click **Add**.
- Repeat until all entries are done, the click **Close**.
- Once all entries are complete, the **Return list attributes** tab should look like this:



Profile name: CUSTOMERS-SMTP-REDIRECT

Idle-Timeout	30
Session-Timeout	360
Colubris-AVPair	smtp-redirect=192.168.2.100
Colubris-AVPair	use-access-list=cust

11. In the **Profile Name** box, select **CUSTOMERS-NO-SMTP.** Define the same set of attributes, except for:

```
Colubris-AVPair   smtp-redirect=192.168.2.100
```

Defining an CN3200 administrator profile

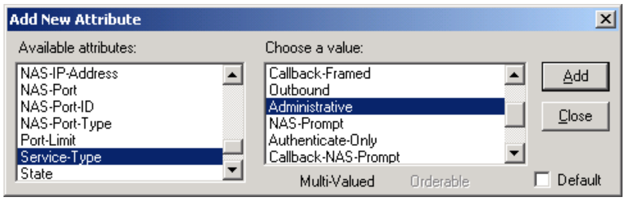
By defining an administrator profile you can enable multiple administrators to log in to the management tool on the CN3200. Each administrator can have their own login name and password. Refer to “Creating administrator profiles on the RADIUS server” on page 232 for more information.

Note: *Only one administrator can log in at a time.*

Note: *Setting up administrator profiles is optional and is not required for proper operation of this sample.*

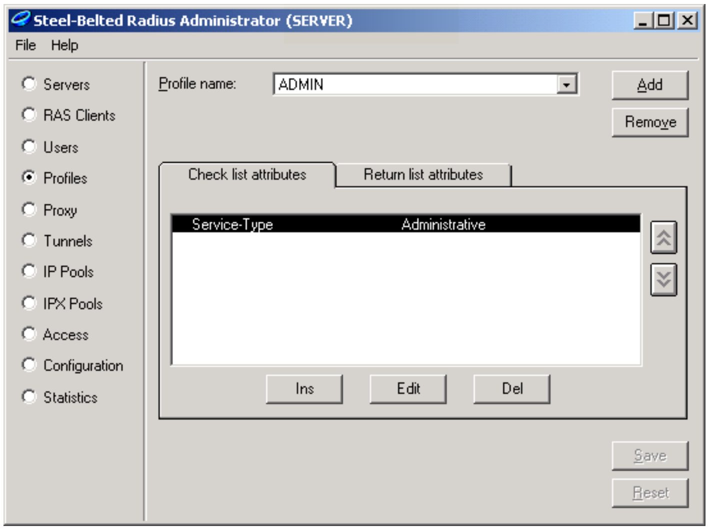
To define the customer profiles, do the following:

1. Click **Profiles**.
2. Click **Add**. The *Add New Profile* dialog box opens.
3. Specify **ADMIN** as the name and click **OK**.
4. Click the **Check list attributes** tab.
5. Click the **Ins** button. The *Add New Attribute* dialog box opens.



6. Select **Service-Type** and set it to the value **Administrative**. Click **Add**.

7. Click **Close**.



Return list attributes are not supported for administrators.

8. Click **Save**.

Step 5: Define user accounts

RADIUS user accounts need to be created for each individual user. The account specifies the login name and password the user will use to login. All other properties are obtained from one of the profiles that were just defined.

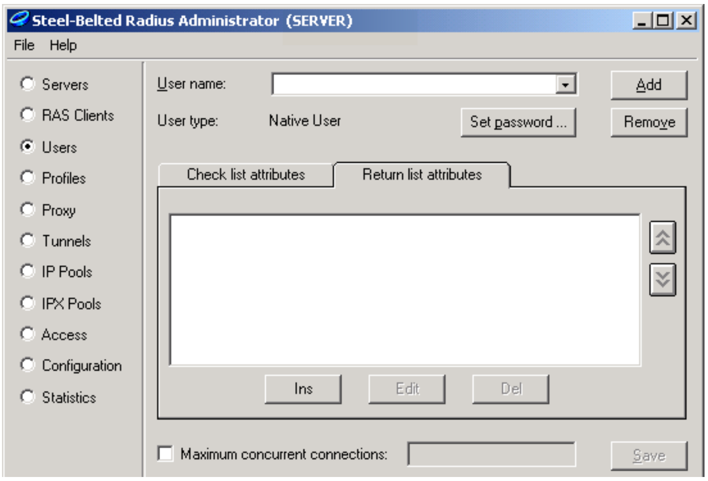
For this example you will create the following RADIUS user accounts:

Username	Password	Associate with profile
customer1	customer1	**CUSTOMERS-NO-SMTP**
customer2	customer2	**CUSTOMERS-SMTP-REDIRECT**
hotspot	hotspot	**Hotspots**
admin	admin	**ADMIN**

Defining user accounts

Repeat the following procedure to create each user account.

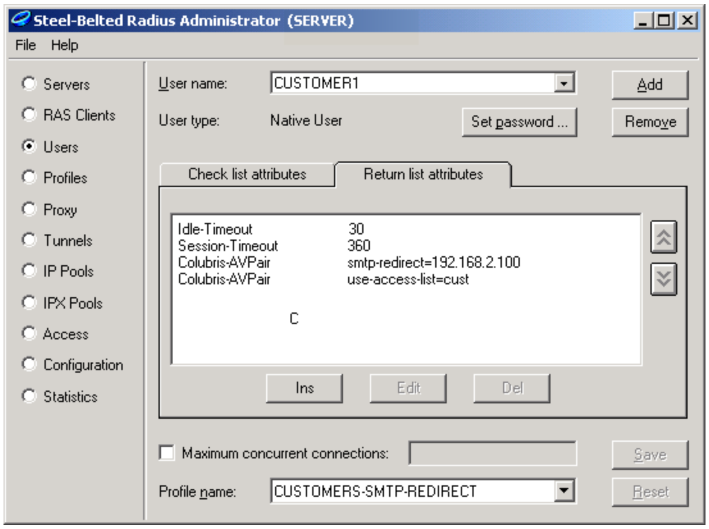
1. Click **Users**.



2. Click **Add**.
3. Specify the **Username** and click **OK**.
4. Click **Set password**. Define the password and click **Set**.

DRAFT

5. In the **Profile name** box, select the profile which will be used as the basis for the account. The settings for the profile will appear. For example:



User name: CUSTOMER1

User type: Native User

```
Idle-Timeout          30
Session-Timeout       360
Colubris-AVPair       smtp-redirect=192.168.2.100
Colubris-AVPair       use-access-list=cust

                C
```

□ Maximum concurrent connections:

Profile name: CUSTOMERS-SMTP-REDIRECT

6. Click **Save**.

Step 6: Install and configure the CN3200

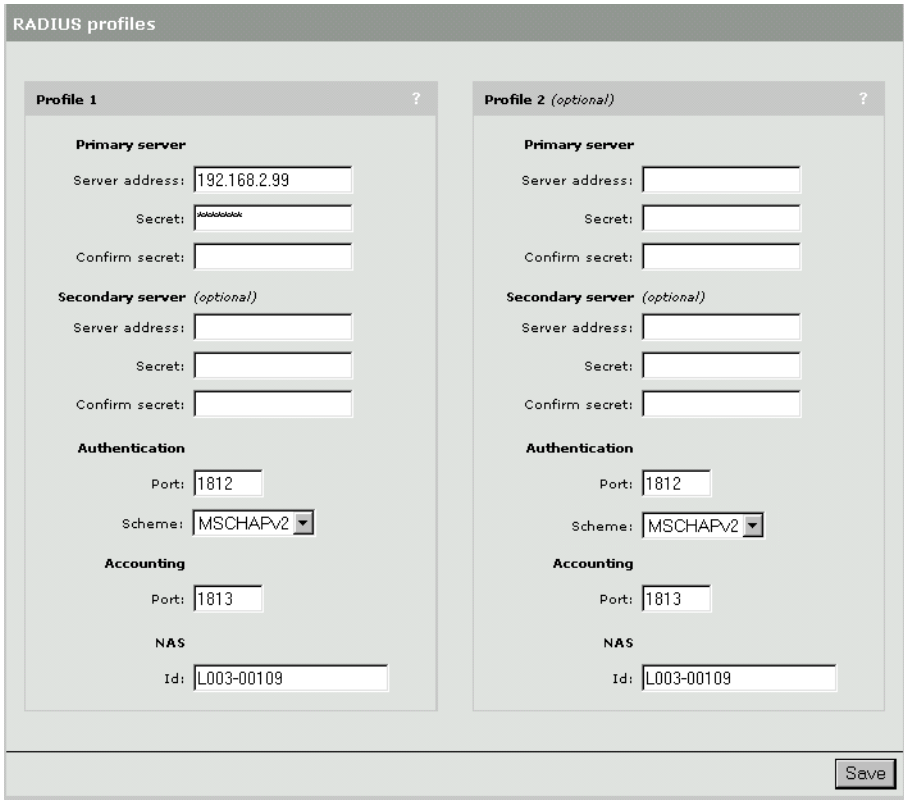
Assign a static address

1. On the **Network** menu, click **Ports.**
2. Click **Internet port** in the table.
3. Select **Static** and then click **Configure**.
4. Make the following settings:
   - IP address: Assign an address. For this example, use the address: **192.168.2.1**
   - Address mask: Assign an appropriate mask. For this example, use the mask: 255.255.255.0.
   - Default gateway: Leave blank. In a real setup this would be set to the address of the router providing access to the Internet.

Configure RADIUS settings

The CN3200 must be configured to communicate with the Steel-Belted Radius server. For a detailed explanation of configuration issues, see Chapter 16: “Customizing CN3200 and customer settings” on page 207.

1. On the **Security** menu, click **RADIUS**. The *RADIUS settings* page opens.



RADIUS profiles

Profile 1

Primary server
Server address: 192.168.2.99
Secret: *******
Confirm secret:

Secondary server *(optional)*
Server address:
Secret:
Confirm secret:

Authentication
Port: 1812
Scheme: MSCHAPv2

Accounting
Port: 1813

NAS
Id: L003-00109

Profile 2 *(optional)*

Primary server
Server address:
Secret:
Confirm secret:

Secondary server *(optional)*
Server address:
Secret:
Confirm secret:

Authentication
Port: 1812
Scheme: MSCHAPv2

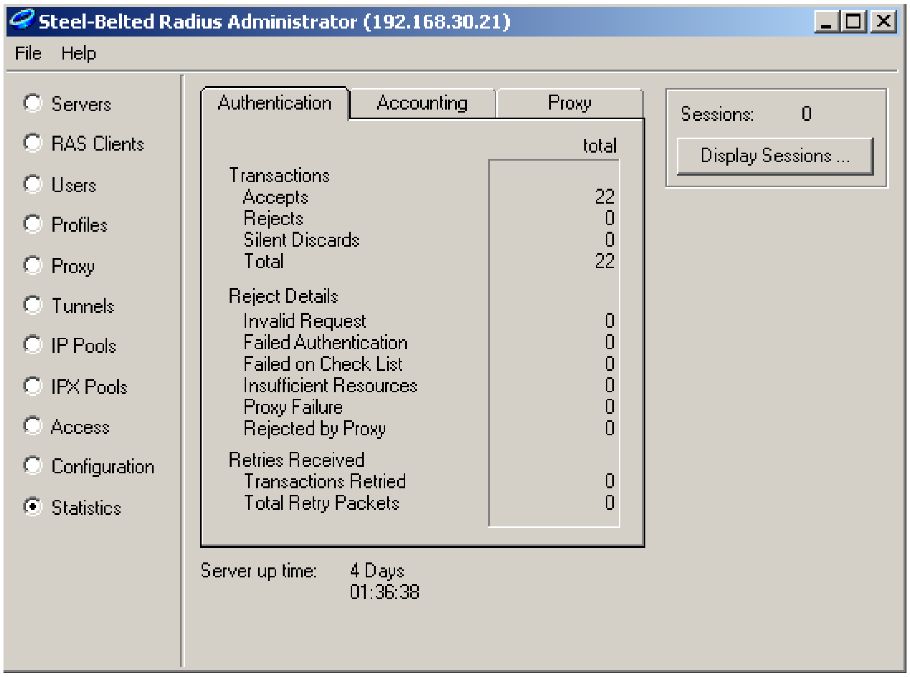
Accounting
Port: 1813

NAS
Id: L003-00109

2. Configure the following parameters:
   - Primary server address: Specify the address of Server 1. For this example, use the address: 192.168.2.99
   - Primary server secret: Specify the secret you defined on when configuring Steel-Belted Radius. For this example, use the secret: **secret**

3. Click **Save**.
4. Click **Authentication**. The *Authentications settings* page opens.
5. In the **Customers** box, set **Authenticate via** to **RADIUS profile 1**.
6. Configure the **CN3200** box as follows:
   - **Authenticate via**: Set to **RADIUS profile 1**.
   - **Login name**: Set to **hotspot**.
   - **Password**: Set to **hotspot**.
7. Enable **Authenticate customers with 802.1x**.
8. Click **Save.** The CN3200 will attempt to connect to the Steel-Belted Radius server. If successful, the status light will change from red to green.

   Note: *You can use the Statistics page on the Steel-Belted Radius Administrator to view progress of the connection.*



○ Servers
○ RAS Clients
○ Users
○ Profiles
○ Proxy
○ Tunnels
○ IP Pools
○ IPX Pools
○ Access
○ Configuration
● Statistics

Sessions: 0

	total
Transactions	
Accepts	22
Rejects	0
Silent Discards	0
Total	22
Reject Details	
Invalid Request	0
Failed Authentication	0
Failed on Check List	0
Insufficient Resources	0
Proxy Failure	0
Rejected by Proxy	0
Retries Received	
Transactions Retried	0
Total Retry Packets	0

Server up time: 4 Days 01:36:38

When you click the **Save** button in the management tool on the CN3200, the number of **Accepts** should be incremented. That means that all settings are properly configured on the CN3200 and Steel-Belted Radius.

If the number of **Rejects** is incremented instead, there may be a problem with a badly set username and/or password. Check the log file in **c:\radius\service**. It is named **2001mmdd.log**, where **mm** is the month and **dd** the day. For example, **20011022.log** for October 22, 2001.

If the number of **Silent Discards** is incremented, it probably means that either the IP address of the CN3200 and/or the shared secret has not been properly configured on the RAS client tab.

You can increase the amount of information in the log file by changing the following values in the **c:\radius\service\radius.ini** file, and restarting Steel-Belted Radius:

```
[Configuration]
LogLevel                 =  0
TraceLevel               =  0
```

Change both values from 0 to 2.

Step 7: Install Server 2

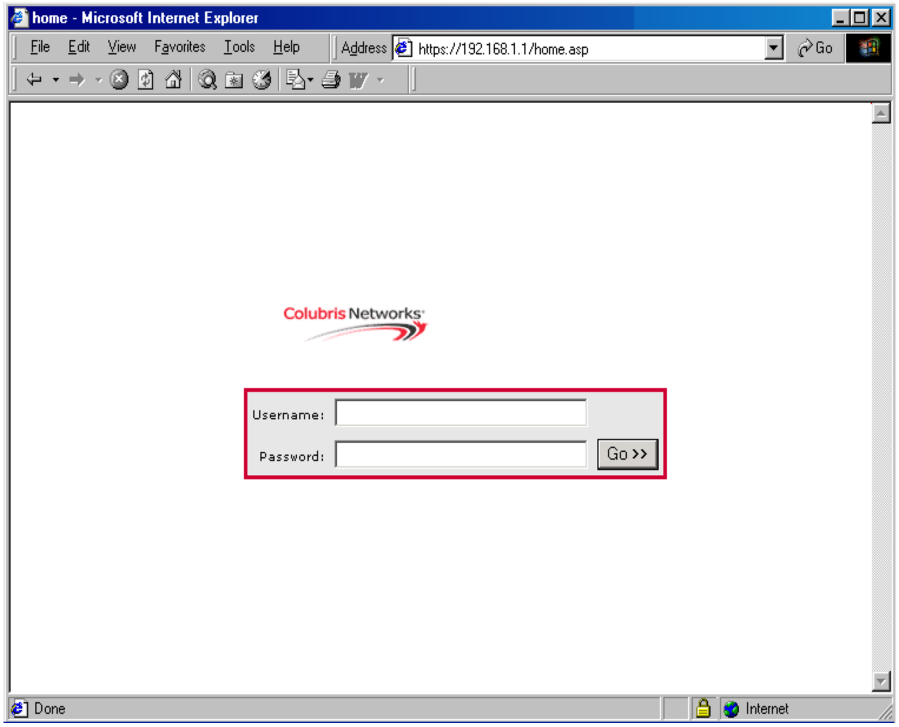
This example assumes Windows 2000 and IIS are installed on Server 2. You can any another operating system and web server.

1. Install Windows 2000 Professional, Server, or Advanced Server and then install Service Pack 3.
2. Make sure that IIS is running.
3. Connect Server 2 to the LAN and assign a static IP address to it. For this example, use the address 192.168.2.100.

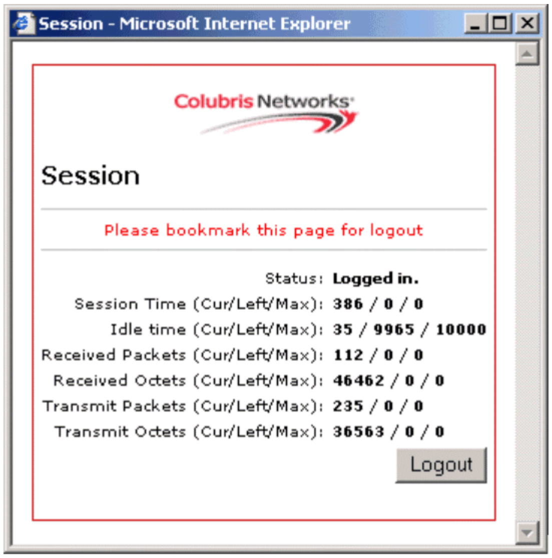
Step 8: Test the installation

To test the installation, use the client station to log onto the public access interface. For this to work, the CN3200 must be configured as the client's default gateway. If you set up your equipment to match the setup of this example, this is automatic. If not, adjust the configuration of the client accordingly.

1. Start the client station's web browser and enter the IP address (or domain name) of Server 2 in the address bar.
2. The CN3200 should intercept the HTTP request and display the login page. Depending on the type of certificate that is installed on the CN3200 you may see a security warning first.


home - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://192.168.1.1/home.asp
Go
Colubris Networks
Username:
Password:
Go >>
Done
Internet

3. To login, specify **customer1** as both the username and password. The CN3200 session page should open.

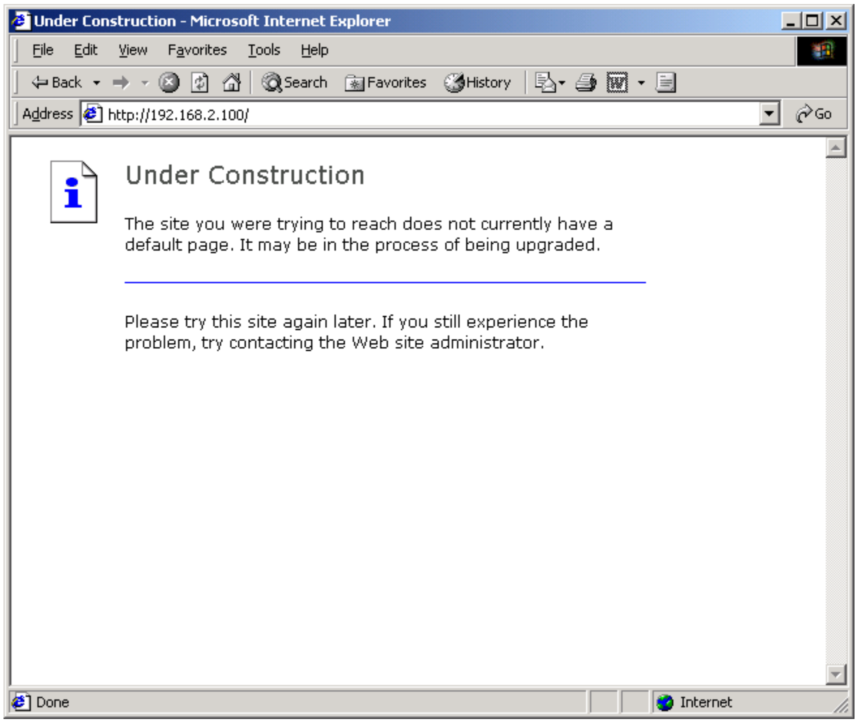


Session

Please bookmark this page for logout

Status: **Logged in.**
Session Time (Cur/Left/Max): **386 / 0 / 0**
Idle time (Cur/Left/Max): **35 / 9965 / 10000**
Received Packets (Cur/Left/Max): **112 / 0 / 0**
Received Octets (Cur/Left/Max): **46462 / 0 / 0**
Transmit Packets (Cur/Left/Max): **235 / 0 / 0**
Transmit Octets (Cur/Left/Max): **36563 / 0 / 0**

4. You should automatically be redirected to the web server on Server 2.


Under Construction - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://192.168.2.100/
Go
Done
Internet

Under Construction

The site you were trying to reach does not currently have a default page. It may be in the process of being upgraded.

Please try this site again later. If you still experience the problem, try contacting the Web site administrator.

Testing administrator logins

If you configured administrator accounts on the RADIUS server, you can test them now as follows:

1. Open the CN3200 management tool with your web browser.
2. On the main menu, click **Management**. The *Management tool configuration* page opens.
3. For **Authenticate via** select **RADIUS profile 1**.
4. Click **Save**.
5. Logout.
6. Login with username and password **admin**.

Chapter 19

Sample setup - Microsoft RADIUS

This chapter provides a walkthrough of a sample RADIUS configuration using Microsoft's RADIUS server (called Internet Authentication Service), that comes with Windows 2000 server and Windows 2000 Advanced server.

The CN3200 is compliant with RFC 2865 and RFC 2866 and will work with a variety of RADIUS servers. This example is for illustrative purposes only and does not imply that you need to use Microsoft’s RADIUS server over any other brand.

IMPORTANT: Before reading this chapter you should familiarize yourself with the concepts discussed in Chapter 15 and Chapter 16.

Overview

The sample setup in this chapter illustrates how to use IAS (Internet Authentication Service) to authenticate customer logins on the CN3200.

Prerequisites

Software

- Windows 2000 Server or Advanced Server (with Service Pack 3), and all recommended updates
- Internet Explorer 6.0 service pack 1

Hardware

- a network hub
- a second network hub or a cross-over cable
- two computers capable of running Windows 2000 Professional, Server or Advanced Server
- a CN3200
- a third computer with a JavaScript-enabled web browser, with or standard Ethernet adapter

Skills

- Familiarity with the installation and operation of TCP/IP-based networks
- Basic knowledge of Windows 2000, including how to use a Windows command-line session.

Equipment setup

This section illustrates the hardware setup that was used to create the sample configuration described in this chapter. If you duplicate this setup, you will not have to change any of the IP addresses supplied in the example.

Topology

The goal of this setup is to simulate a working environment with the least amount of equipment. To this end, the ‘public network’ is considered to be any device connected to the LAN port on the CN3200. The ‘protected network resources’ are connected to the Internet port on the CN3200. In this example, both Server 1 and Server 2 are on the protected network. Server 1 hosts the IAS server. Server 2 is used to simulate an external web server.

See “Wiring details” on page 358 for information on how to build a x-over cable.

About the components

Server 1

Server 1 is the computer that you install Windows 2000 server and IAS on.

Server 2

Server 2 is required to test the setup once it is complete. You should install a web server on this computer. The client station will attempt to access this web server via the CN3200.

Client station

The client station is required to test the setup once it is complete. The DHCP server on the CN3200 will assign an address to this computer.

Step 1: Install software on Server 1

Windows 2000

1. Install Windows 2000 Server or Advanced Server and then install Service Pack 3 and all recommended updates.
2. Make sure that IAS is also installed.
3. Connect Server 1 to the hub and assign a static IP address to it. For this example, use the address 192.168.2.99.
4. Shut down and restart Server 1.

Internet Explorer

Install Internet Explorer 6 SP1 on the server. The support files included with this application are required for proper operation.

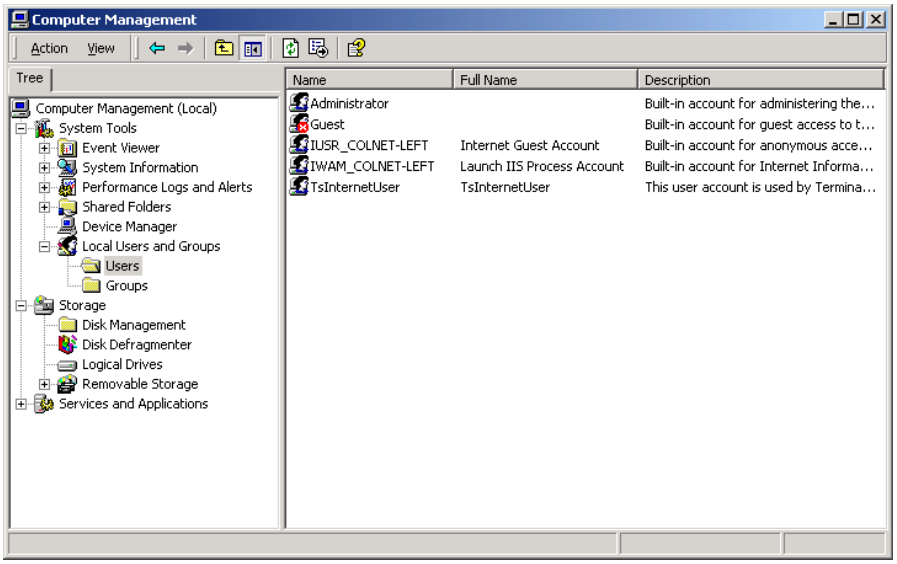
Step 2: Define user accounts

On server 1, accounts need to be created in Windows for three types of users as follows:

- each CN3200 must have its own account
- each administrator must have their own account
- each customer must have their own account

To create the accounts

1. Click **Start** > **Programs** > **Administrative Tools** > **Computer Management**.
2. Double click **Local Users and Groups**.
3. Click **Users**.



Name	Full Name	Description
Administrator		Built-in account for administering the…
Guest		Built-in account for guest access to t…
IUSR_COLNET-LEFT	Internet Guest Account	Built-in account for anonymous acce…
IWAM_COLNET-LEFT	Launch IIS Process Account	Built-in account for Internet Informa…
TsInternetUser	TsInternetUser	This user account is used by Termina…

4. Create the following user accounts by clicking **New User** on the **Action** menu:

Username	Password
customer1	customer1
customer2	customer2
hotspot	hotspot
admin	admin1

Step 3: Define groups and add users to them

Groups let you define a set of common attributes for one or more users. You will need to create at least four groups:

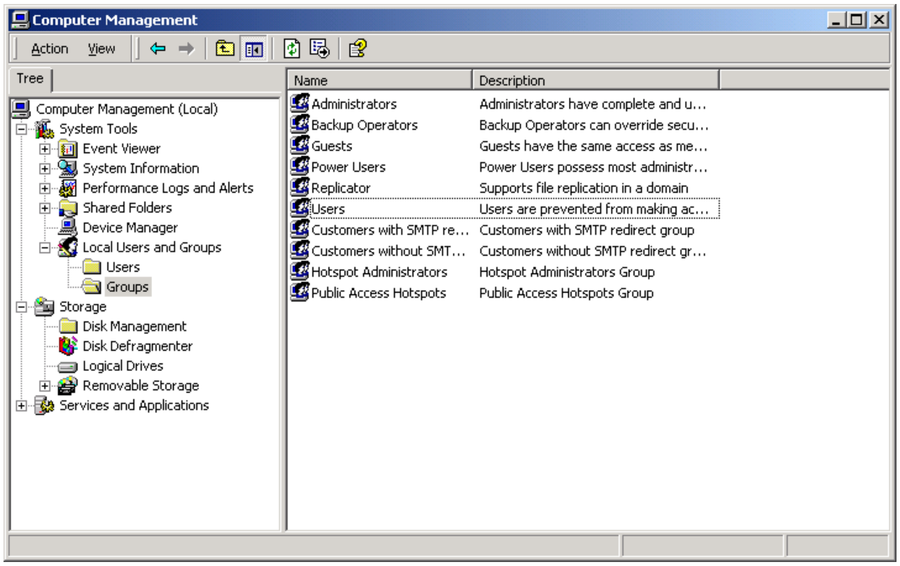
- CN3200 devices
- CN3200 administrators
- Customers with SMTP redirection
- Customers without SMTP redirection

To create the groups

1. Click **Groups**.
2. Create the following groups by clicking **New Group** on the **Action** menu. After you create each group you will be prompted to add users.

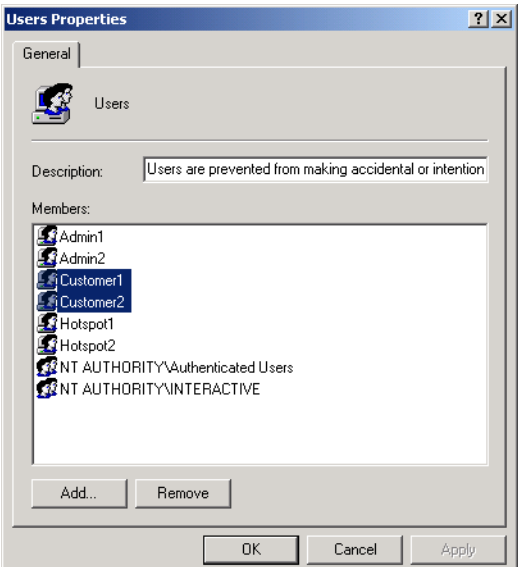
Group to create	Add these users
Public Access Hotspots	hotpspot
Customers with SMTP redirect	customer1
Customers without SMTP redirect	customer2
Hotspot Administrators	admin

3. Click **Users**.



Name	Description
Administrators	Administrators have complete and u…
Backup Operators	Backup Operators can override secu…
Guests	Guests have the same access as me…
Power Users	Power Users possess most administr…
Replicator	Supports file replication in a domain
Users	Users are prevented from making ac…
Customers with SMTP re…	Customers with SMTP redirect group
Customers without SMT…	Customers without SMTP redirect gr…
Hotspot Administrators	Hotspot Administrators Group
Public Access Hotspots	Public Access Hotspots Group

4. All users are automatically added to the **Users** group. Select **customer1** and **customer2** and click **Remove**. You need to remove these users so they do not have access to Server 1.



Users

Description: Users are prevented from making accidental or intention

Members:

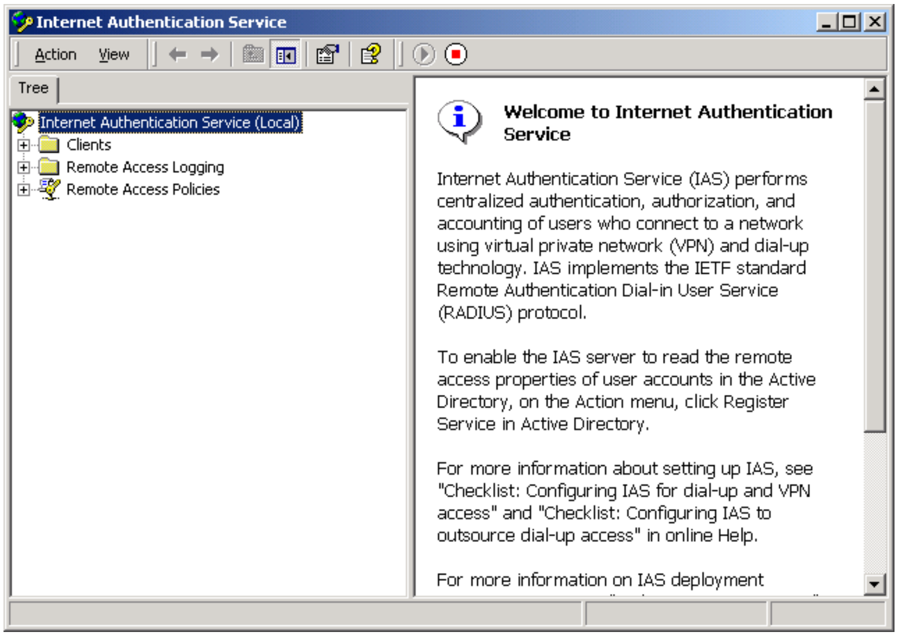
Admin1
Admin2
Customer1
Customer2
Hotspot1
Hotspot2
NT AUTHORITY\Authenticated Users
NT AUTHORITY\INTERACTIVE

5. Click **OK**.

Step 4: Start the RADIUS server

Start the RADIUS server configuration by selecting Start Menu/Programs/ Administrative Tools/Internet Authenticating Service. The following window will open.

1. Click **Start** > **Programs** > **Administrative Tools** > **IAS**.


Internet Authentication Service
Action
View
Tree
Internet Authentication Service (Local)
Clients
Remote Access Logging
Remote Access Policies

Welcome to Internet Authentication Service

Internet Authentication Service (IAS) performs centralized authentication, authorization, and accounting of users who connect to a network using virtual private network (VPN) and dial-up technology. IAS implements the IETF standard Remote Authentication Dial-in User Service (RADIUS) protocol.

To enable the IAS server to read the remote access properties of user accounts in the Active Directory, on the Action menu, click Register Service in Active Directory.

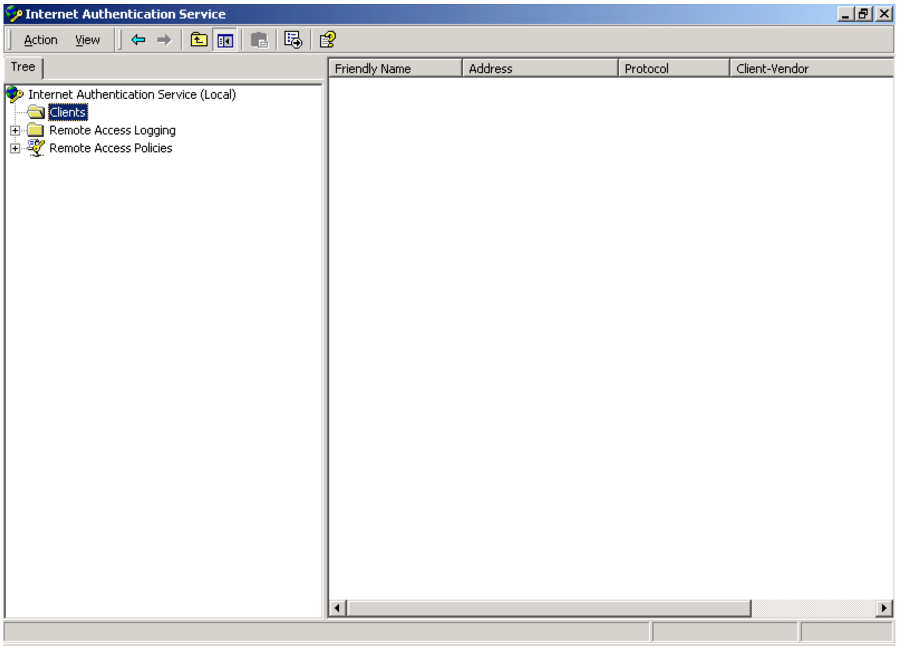
For more information about setting up IAS, see "Checklist: Configuring IAS for dial-up and VPN access" and "Checklist: Configuring IAS to outsource dial-up access" in online Help.

For more information on IAS deployment

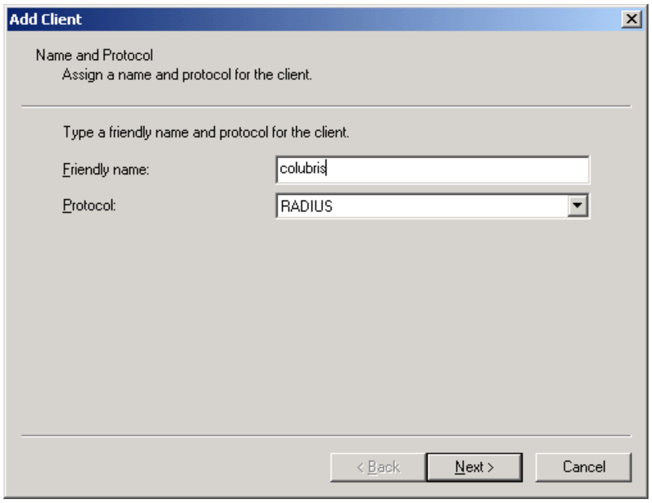
Step 5: Create a RADIUS client account

A RADIUS client is any device that uses the services of a RADIUS server. Therefore, each CN3200 is considered to be a RADIUS client and must have its own client account.

1. Click **Clients**.



2. On the **Action** menu, click **New client**. The *Add Client* dialog box opens.



Type a friendly name and protocol for the client.

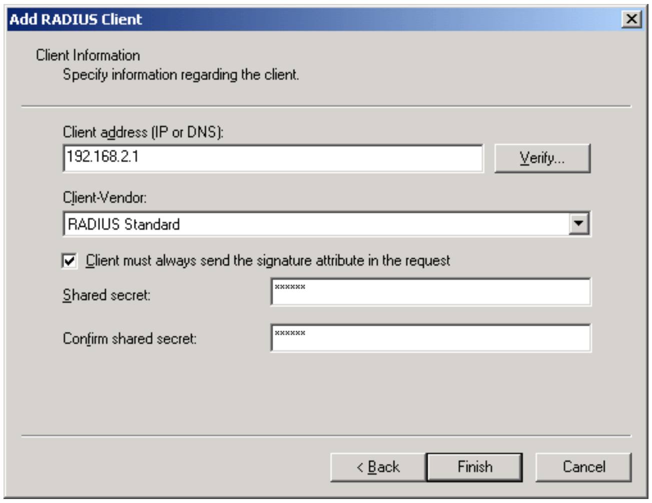
Friendly name: colubris

Protocol: RADIUS

3. Specify a **Friendly name** for the CN3200. For this example, use **colubris**. This value is used by the RADIUS server only. It is not configured on the CN3200.

4. Choose **RADIUS** as the **Protocol**.

5. Click **Next**. The *Add RADIUS Client* dialog box opens.



Add RADIUS Client

Client Information

Specify information regarding the client.

Client address (IP or DNS): 192.168.2.1

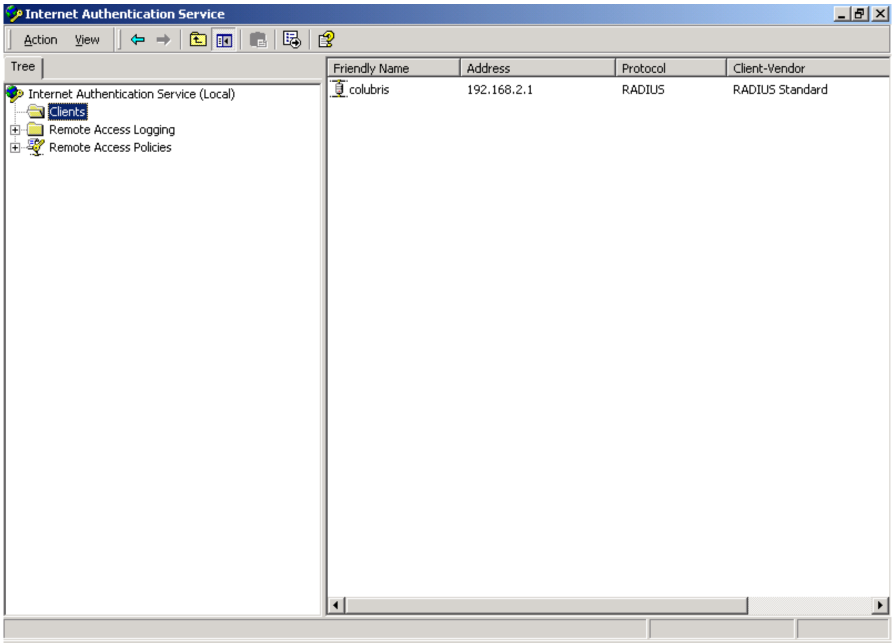
Client-Vendor: RADIUS Standard

☑ Client must always send the signature attribute in the request

Shared secret: ******

Confirm shared secret: ******

6. In **Client address** specify the IP address of the CN3200's Internet port. For this example, specify **192.168.2.1**.
7. Leave **Client-Vendor** set to **RADIUS Standard**.
8. Leave **Client must always send the signature attribute in the request** checked. The CN3200 always sends the signature attribute.
9. Define a unique **Shared secret** for the CN3200. For this example, use the secret **secret**.
10. Click **Finish**.



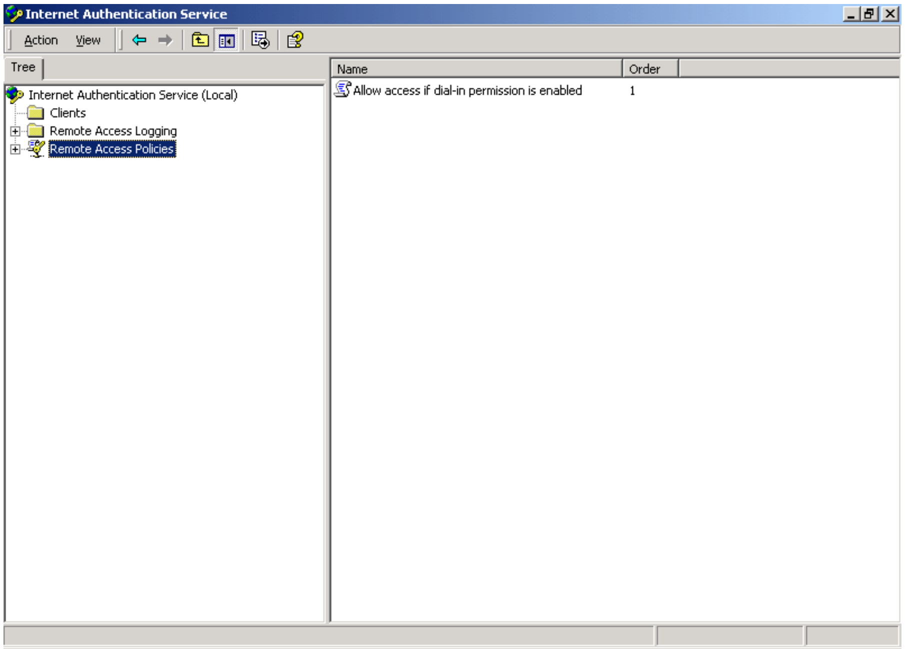
Internet Authentication Service

Friendly Name	Address	Protocol	Client-Vendor
colubris	192.168.2.1	RADIUS	RADIUS Standard

Step 6: Create an access policy for the CN3200

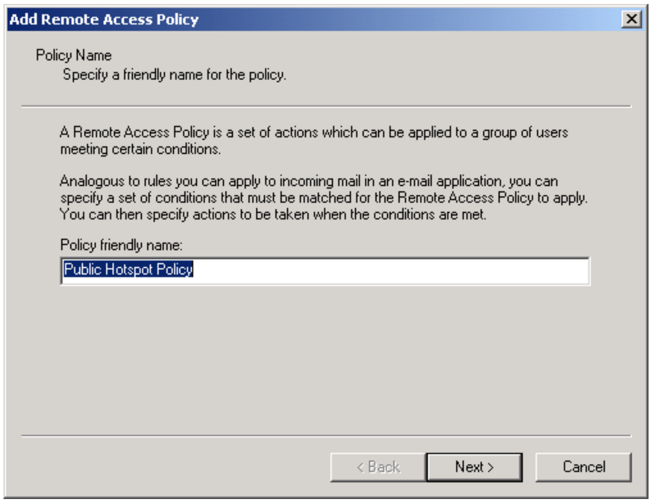
A remote access policy is a set of actions that apply to a group of RADIUS users. This section shows how to define an access policy for the Public Access Hotspots group.

1. Click **Remote Access Policies**.



Allow access if dial-in permission is enabled 1

2. On the **Action** menu, click **New remote access policy**. The *Add Remote Access Policy* dialog box opens.



Policy Name
Specify a friendly name for the policy.

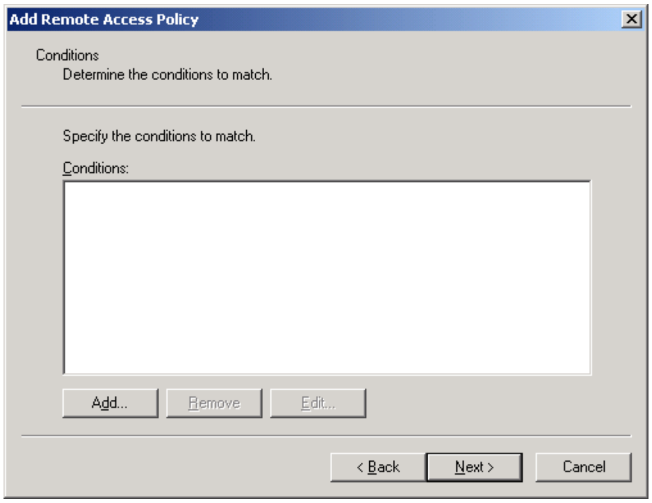
A Remote Access Policy is a set of actions which can be applied to a group of users meeting certain conditions.

Analogous to rules you can apply to incoming mail in an e-mail application, you can specify a set of conditions that must be matched for the Remote Access Policy to apply. You can then specify actions to be taken when the conditions are met.

Policy friendly name: Public Hotspot Policy

3. Specify a **Policy friendly name**. For this example, specify **Public Hotspot Policy**.

4. Click **Next**. The **Add Remote Access Policy** dialog box opens.


Add Remote Access Policy

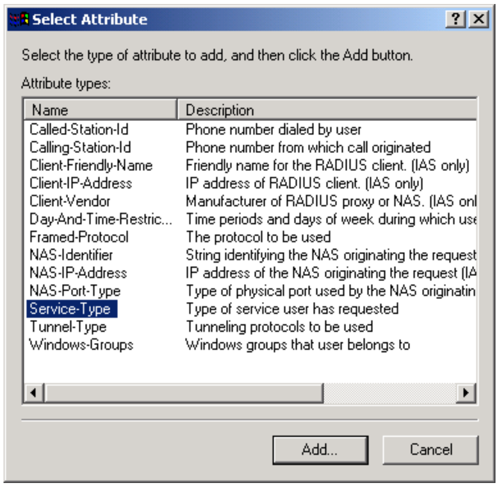
Conditions
Determine the conditions to match.

Specify the conditions to match.

Conditions:

5. Click **Add**. The *Select Attribute* dialog box opens.

6. Select **Service** type and click **Add**.

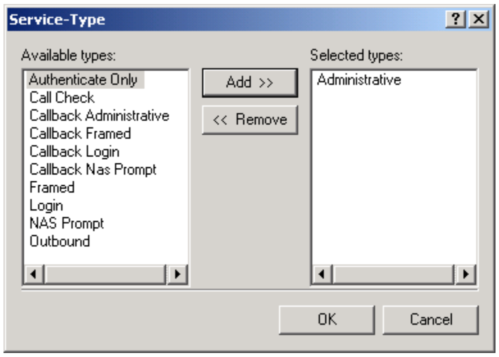

Select Attribute

Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

7. Select **Administrative**, click **Add**, and then click **OK**.


Service-Type

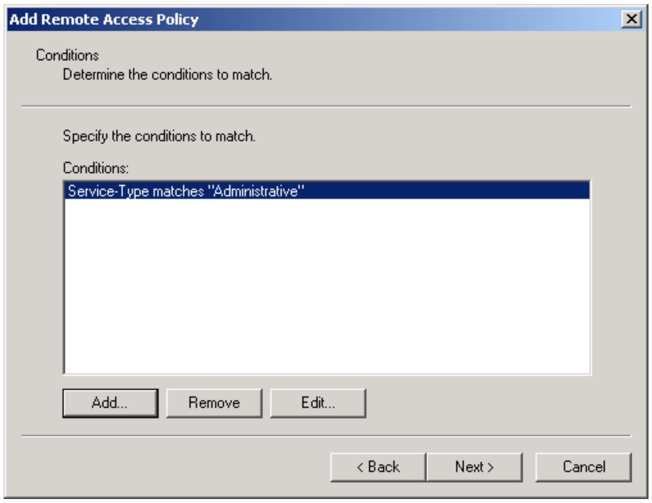
Available types:

Authenticate Only
Call Check
Callback Administrative
Callback Framed
Callback Login
Callback Nas Prompt
Framed
Login
NAS Prompt
Outbound

Selected types:

Administrative

8. You return *Add Remote Access Policy* dialog box.



Add Remote Access Policy

Conditions
Determine the conditions to match.

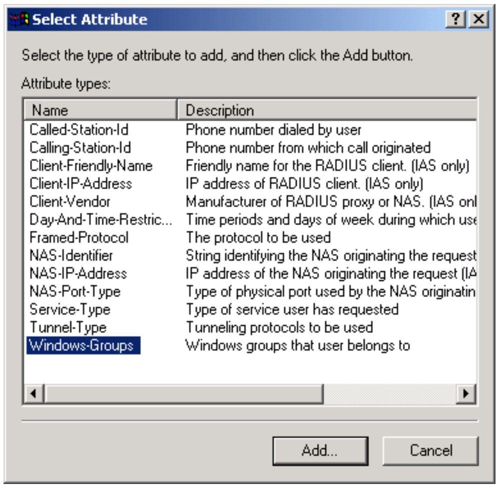
Specify the conditions to match.

Conditions:

Service-Type matches "Administrative"

9. Click **Add**. The *Select Attribute* dialog box opens.

10. Select **Windows-Groups** and click **Add**.



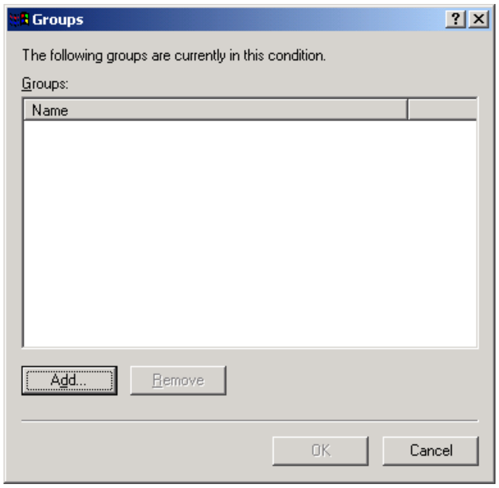
Select Attribute

Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

11. The *Groups* dialog box opens. Click **Add**.



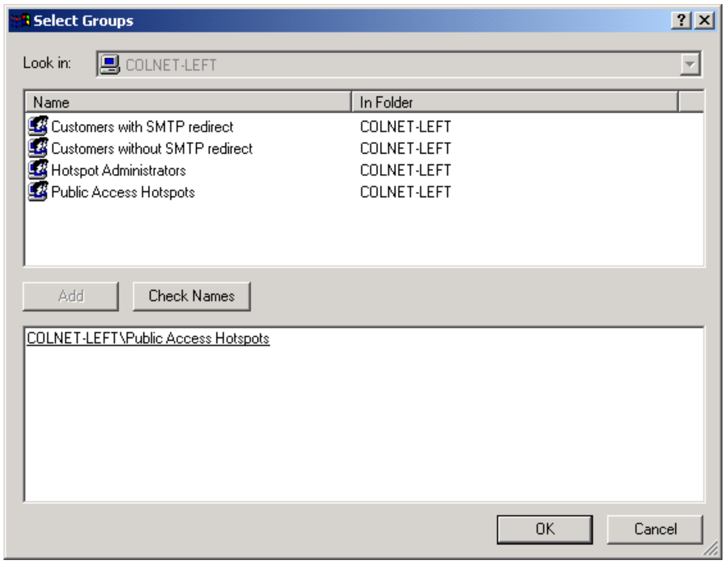
Groups

The following groups are currently in this condition.

Groups:

Name	

12. The *Select Groups* dialog box opens. Select **Public Access Hotspots** and then click **Add** and then **OK**.

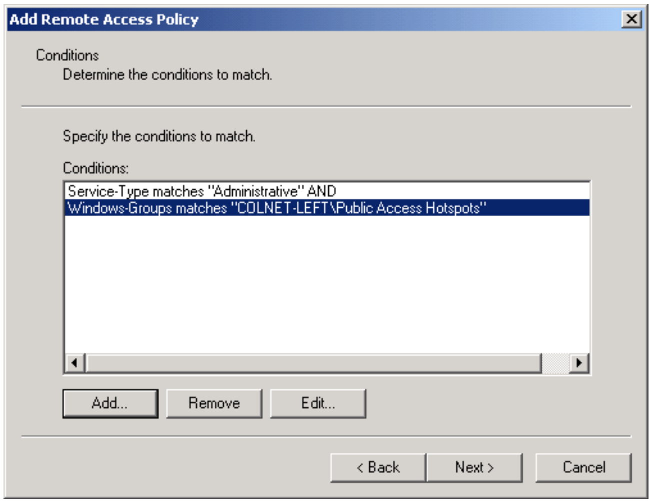


Look in: COLNET-LEFT

Name	In Folder
Customers with SMTP redirect	COLNET-LEFT
Customers without SMTP redirect	COLNET-LEFT
Hotspot Administrators	COLNET-LEFT
Public Access Hotspots	COLNET-LEFT

COLNET-LEFT\Public Access Hotspots

13. Return to the *Add Remote Access Policy* dialog box and click **Next**.

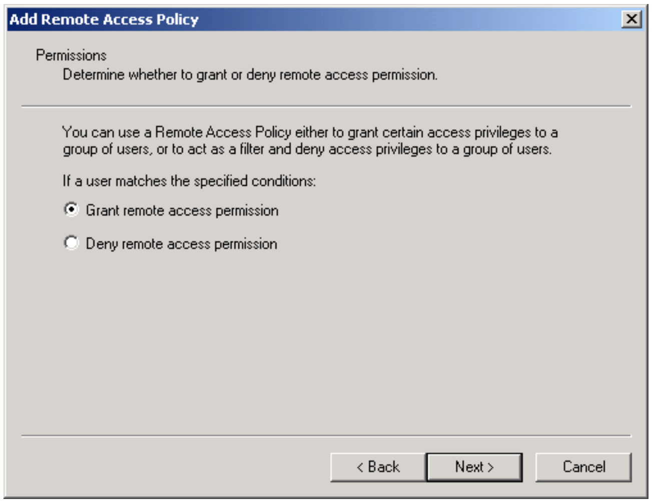


Conditions
Determine the conditions to match.

Specify the conditions to match.

Conditions:
Service-Type matches "Administrative" AND
Windows-Groups matches "COLNET-LEFT\Public Access Hotspots"

14. Select **Grant remote access permission** and click **Next**.



Permissions
Determine whether to grant or deny remote access permission.

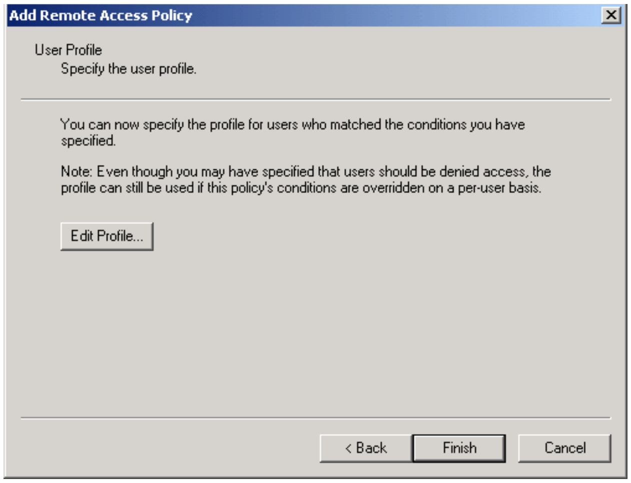
You can use a Remote Access Policy either to grant certain access privileges to a group of users, or to act as a filter and deny access privileges to a group of users.

If a user matches the specified conditions:

● Grant remote access permission

○ Deny remote access permission

15. Click **Edit Profile**.



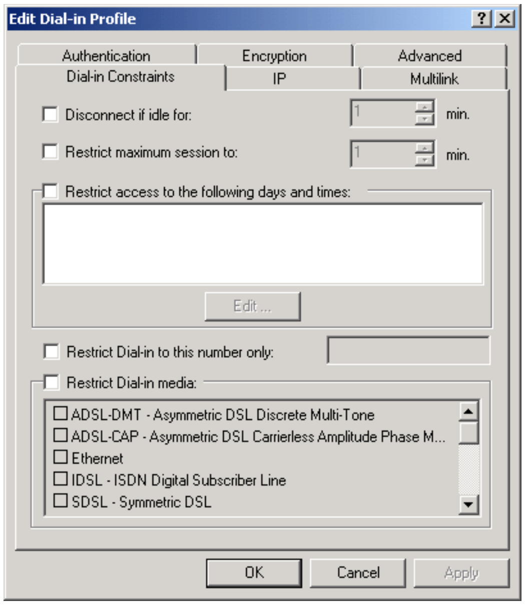
Add Remote Access Policy

User Profile
Specify the user profile.

You can now specify the profile for users who matched the conditions you have specified.

Note: Even though you may have specified that users should be denied access, the profile can still be used if this policy's conditions are overridden on a per-user basis.

16. The **Edit-Dial-in Profile** window opens.



Edit Dial-in Profile

□ Disconnect if idle for: 1 min.

□ Restrict maximum session to: 1 min.

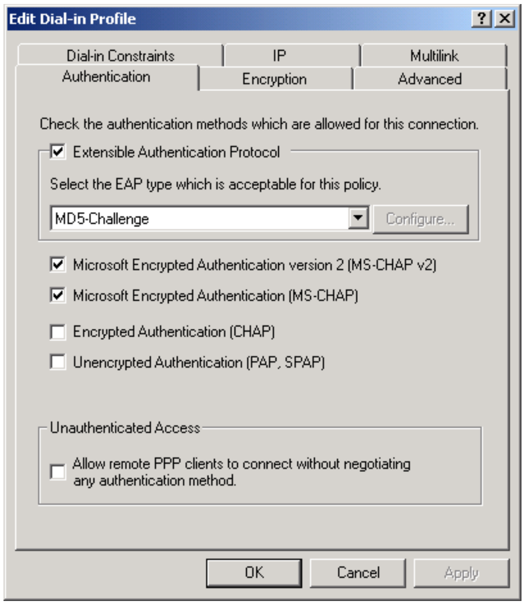
□ Restrict access to the following days and times:

□ Restrict Dial-in to this number only:

□ Restrict Dial-in media:

- □ ADSL-DMT - Asymmetric DSL Discrete Multi-Tone
- □ ADSL-CAP - Asymmetric DSL Carrierless Amplitude Phase M...
- □ Ethernet
- □ IDSL - ISDN Digital Subscriber Line
- □ SDSL - Symmetric DSL

17. Click the **Authentication** tab and enable the options as shown.



Edit Dial-in Profile

Check the authentication methods which are allowed for this connection.

☑ Extensible Authentication Protocol

Select the EAP type which is acceptable for this policy.

MD5-Challenge

☑ Microsoft Encrypted Authentication version 2 (MS-CHAP v2)

☑ Microsoft Encrypted Authentication (MS-CHAP)

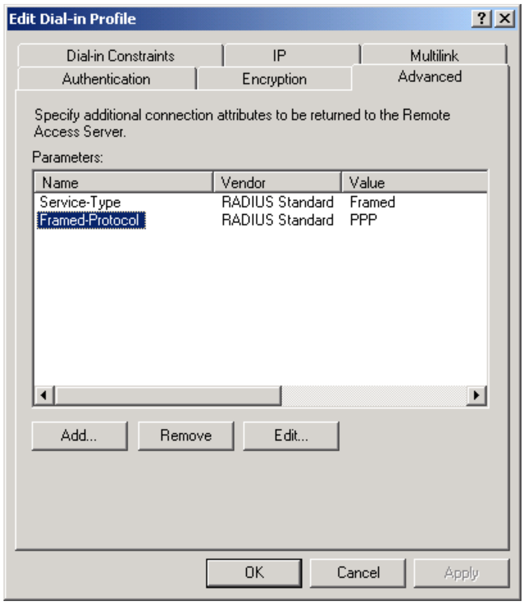
□ Encrypted Authentication (CHAP)

□ Unencrypted Authentication (PAP, SPAP)

Unauthenticated Access

□ Allow remote PPP clients to connect without negotiating any authentication method.

18. Click the **Advanced** tab.



Specify additional connection attributes to be returned to the Remote Access Server.

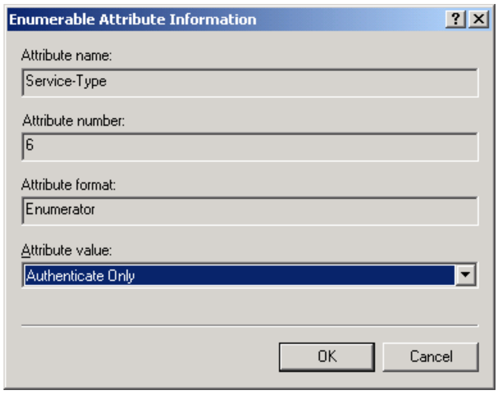
Parameters:

Name	Vendor	Value
Service-Type	RADIUS Standard	Framed
Framed-Protocol	RADIUS Standard	PPP

This tab is where you specify the values that are returned to the CN3200 when it logs into the RADIUS server.

19. Select **Framed-Protocol** and click **Remove**.

20. Select **Service-Type** and click **Edit**. The *Enumerable Attribute Information* dialog box opens.



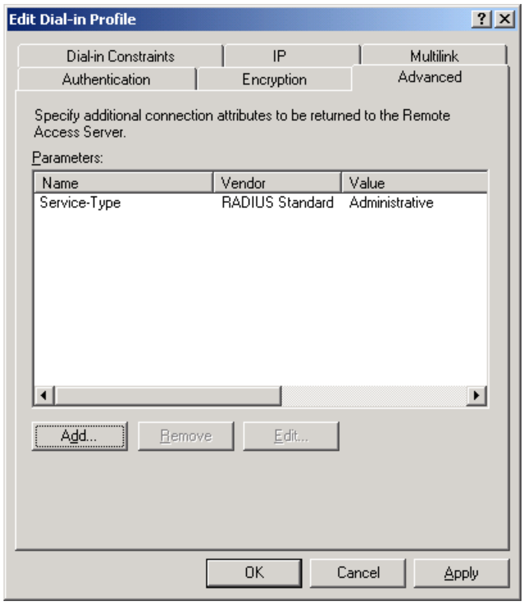
Attribute name: Service-Type

Attribute number: 6

Attribute format: Enumerator

Attribute value: Authenticate Only

21. Select **Administrative** for **Attribute value** and click **OK**.



Specify additional connection attributes to be returned to the Remote Access Server.

Parameters:

Name	Vendor	Value
Service-Type	RADIUS Standard	Administrative

You can now specify the attributes that will be returned to the CN3200 after it is successfully authenticated. This enables you to define a number of important operating characteristics, including:

- The location of custom HTML pages that must be downloaded by the CN3200.
- One or more access lists for specifying the set of network resources customers have access to.

For this example, you should create the following entry:

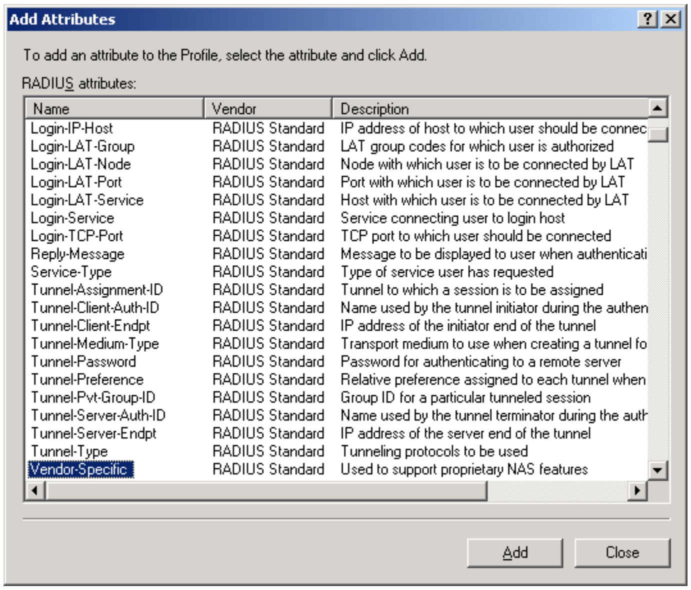
```
Colubris-AVPair   access-list=cust,ACCEPT,tcp,192.168.2.100,80
```

This access list permits only authenticated customers to access the web server at 192.168.2.100.

(Refer to "Creating a profile for the CN3200 on the RADIUS server" on page 214 for a complete list of all supported attributes.)

To add this entry:

- Click **Add.** The *Add Attributes* dialog box opens.

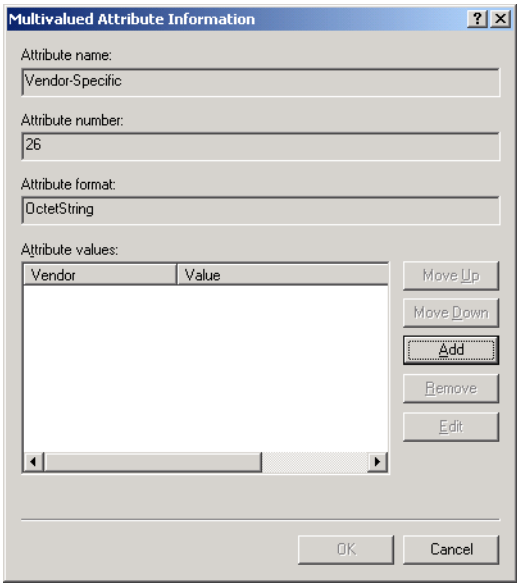


To add an attribute to the Profile, select the attribute and click Add.

RADIUS attributes:

Name	Vendor	Description
Login-IP-Host	RADIUS Standard	IP address of host to which user should be connec
Login-LAT-Group	RADIUS Standard	LAT group codes for which user is authorized
Login-LAT-Node	RADIUS Standard	Node with which user is to be connected by LAT
Login-LAT-Port	RADIUS Standard	Port with which user is to be connected by LAT
Login-LAT-Service	RADIUS Standard	Host with which user is to be connected by LAT
Login-Service	RADIUS Standard	Service connecting user to login host
Login-TCP-Port	RADIUS Standard	TCP port to which user should be connected
Reply-Message	RADIUS Standard	Message to be displayed to user when authenticati
Service-Type	RADIUS Standard	Type of service user has requested
Tunnel-Assignment-ID	RADIUS Standard	Tunnel to which a session is to be assigned
Tunnel-Client-Auth-ID	RADIUS Standard	Name used by the tunnel initiator during the authen
Tunnel-Client-Endpt	RADIUS Standard	IP address of the initiator end of the tunnel
Tunnel-Medium-Type	RADIUS Standard	Transport medium to use when creating a tunnel fo
Tunnel-Password	RADIUS Standard	Password for authenticating to a remote server
Tunnel-Preference	RADIUS Standard	Relative preference assigned to each tunnel when
Tunnel-Pvt-Group-ID	RADIUS Standard	Group ID for a particular tunneled session
Tunnel-Server-Auth-ID	RADIUS Standard	Name used by the tunnel terminator during the auth
Tunnel-Server-Endpt	RADIUS Standard	IP address of the server end of the tunnel
Tunnel-Type	RADIUS Standard	Tunneling protocols to be used
Vendor-Specific	RADIUS Standard	Used to support proprietary NAS features

- Select **Vendor-Specific** and click **Add**. The *Multivalued Attribute Information* dialog box opens.



Attribute name:
Vendor-Specific

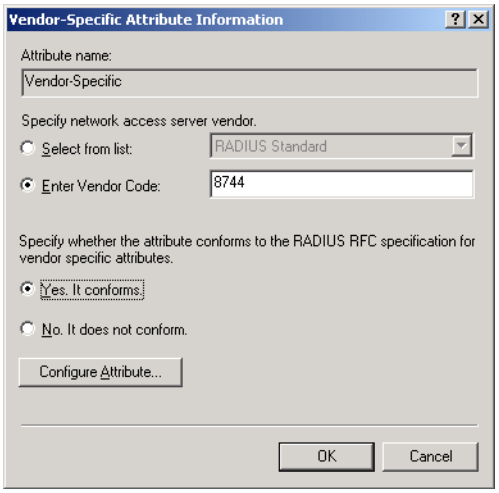
Attribute number:
26

Attribute format:
OctetString

Attribute values:

Vendor	Value

- Click **Add** to add a new attribute.



Vendor-Specific Attribute Information

Attribute name: Vendor-Specific

Specify network access server vendor.

○ Select from list: RADIUS Standard

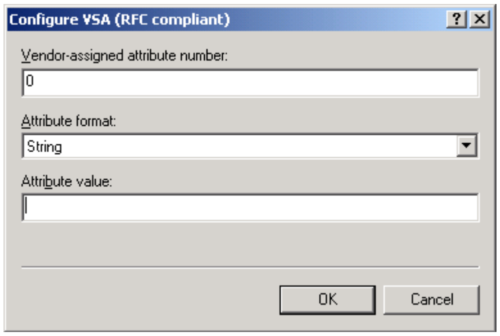
● Enter Vendor Code: 8744

Specify whether the attribute conforms to the RADIUS RFC specification for vendor specific attributes.

● Yes. It conforms.

○ No. It does not conform.

- Specify the Colubris Networks vendor code **8744** in **Enter Vendor Code**.
- Select **Yes. It conforms.**
- Click **Configure Attribute**. The *Configure VSA (RFC compliant)* dialog box opens.



Configure VSA (RFC compliant)

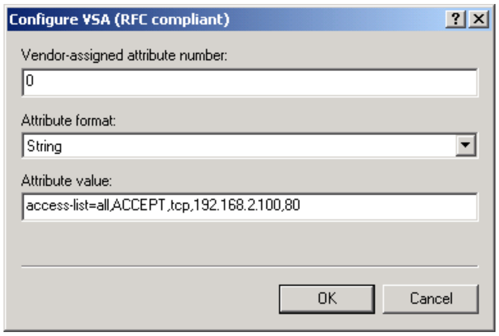
Vendor-assigned attribute number: 0

Attribute format: String

Attribute value:

- For **Vendor-assigned attribute number**, specify 0.
- For **Attribute format**, select **String.**
- For **Attribute value**, specify the following attribute:
  - access-list=all,ACCEPT,tcp,192.168.2.100,80

  For example:



Configure VSA (RFC compliant)

Vendor-assigned attribute number: 0

Attribute format: String

Attribute value: access-list=all,ACCEPT,tcp,192.168.2.100,80

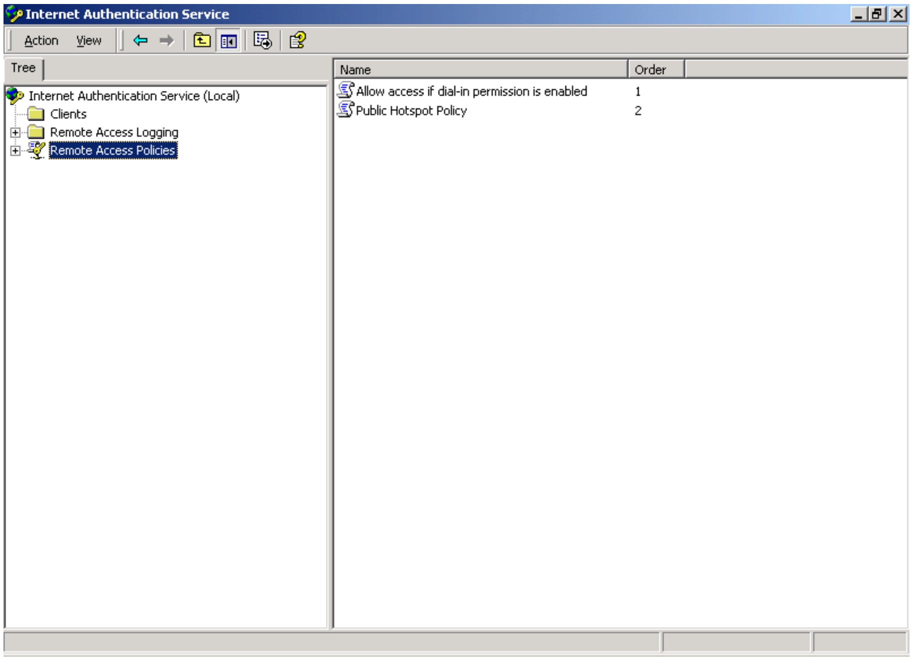
22. When done, click **OK** on all dialog boxes to return to the **Add Remote Access Policy** dialog box.

23. Click **Finish**.

Step 7: Create an access policy for customers

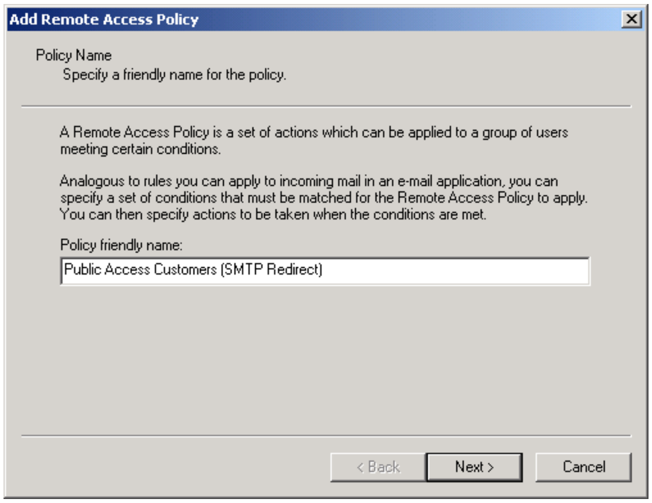
This section explains how to create a remote access policy for both Public Access Customers (SMTP Redirect) and Public Access Customers (no SMTP Redirect). Creation of both policies is identical expect for a few steps at the end of the procedure. So repeat this procedure to create both policies.

1. Click **Remote Access Policies**.


Internet Authentication Service
Action View
Tree
Internet Authentication Service (Local)
Clients
Remote Access Logging
Remote Access Policies

Name	Order
Allow access if dial-in permission is enabled	1
Public Hotspot Policy	2

2. On the **Action** menu, click **New remote access policy**. The *Add Remote Access Policy* dialog box opens.



Policy Name
Specify a friendly name for the policy.

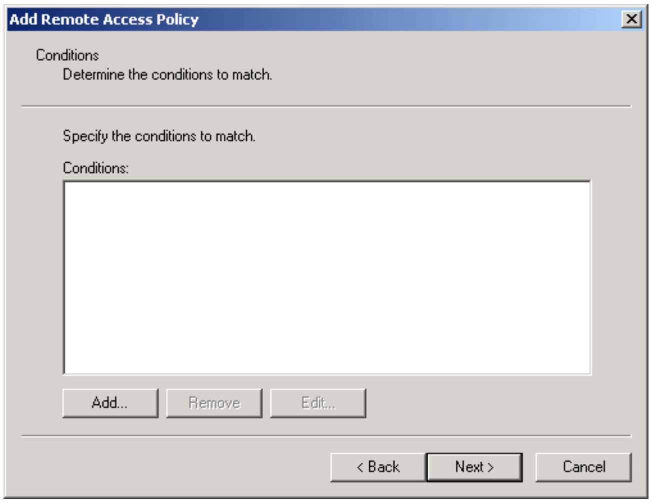
A Remote Access Policy is a set of actions which can be applied to a group of users meeting certain conditions.

Analogous to rules you can apply to incoming mail in an e-mail application, you can specify a set of conditions that must be matched for the Remote Access Policy to apply. You can then specify actions to be taken when the conditions are met.

Policy friendly name: Public Access Customers (SMTP Redirect)

3. Specify a **Policy friendly name** for the policy. The first time you execute this procedure specify **Public Access Customers (SMTP Redirect)** and the second time specify **Public Access Customers (no SMTP Redirect)**.

4. Click **Next**. The **Add Remote Access Policy** dialog box opens.



Conditions

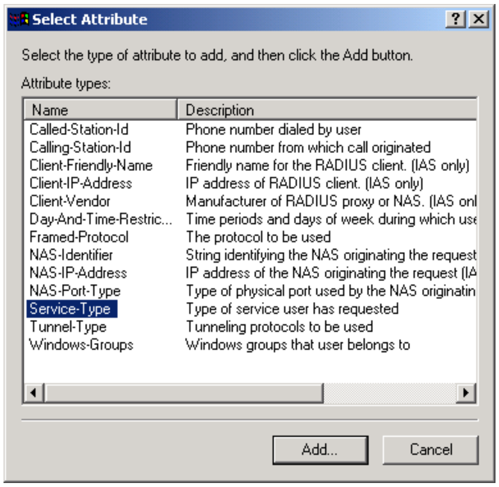
Determine the conditions to match.

Specify the conditions to match.

Conditions:

5. Click **Add**. The *Select Attribute* dialog box opens.

6. Select **Service-Type** and click **Add.**

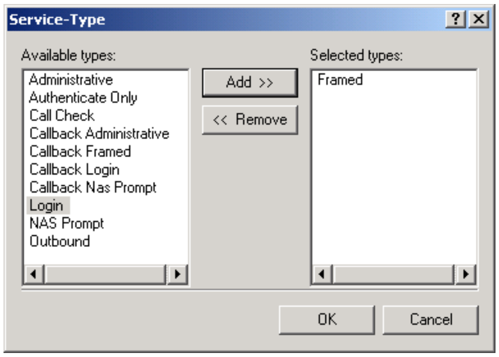


Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

7. Select **Framed**, click **Add**, then click **OK.**



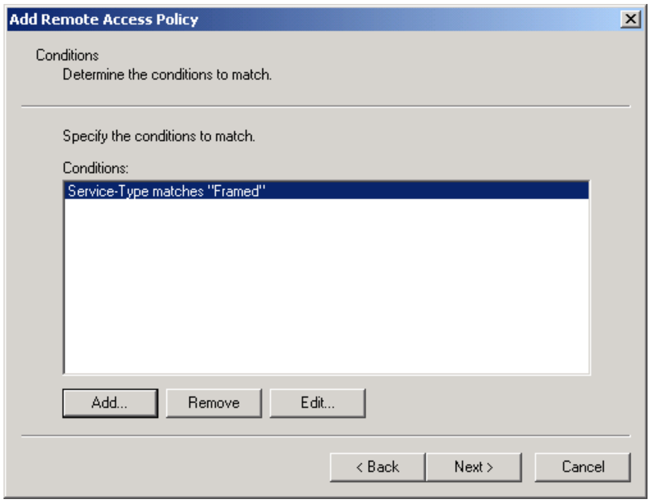
Available types:

Administrative
Authenticate Only
Call Check
Callback Administrative
Callback Framed
Callback Login
Callback Nas Prompt
Login
NAS Prompt
Outbound

Selected types:

Framed

8. Return to the *Add Remote Access Policy* dialog box.



Determine the conditions to match.

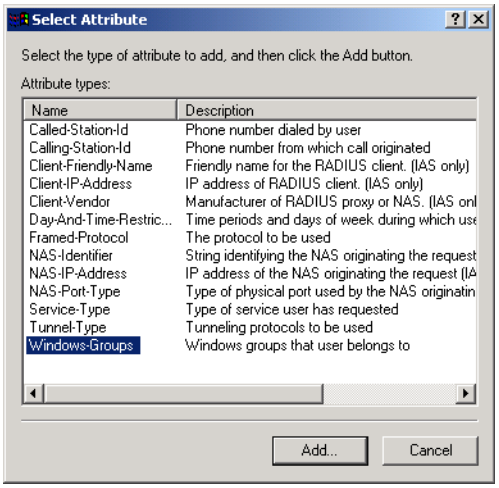
Specify the conditions to match.

Conditions:

Service-Type matches "Framed"

9. Click **Add**. The *Select Attribute* dialog box opens.

10. Select **Windows-Groups** and click **Add**.

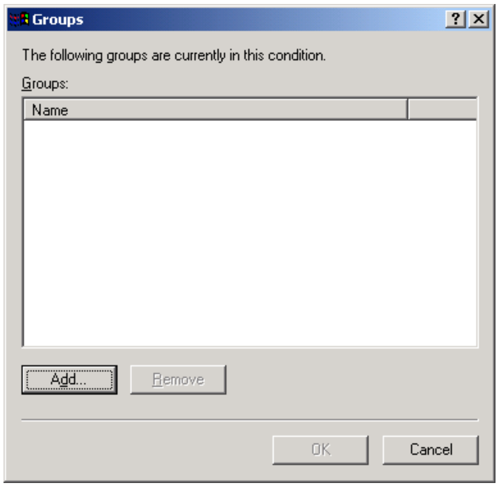


Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

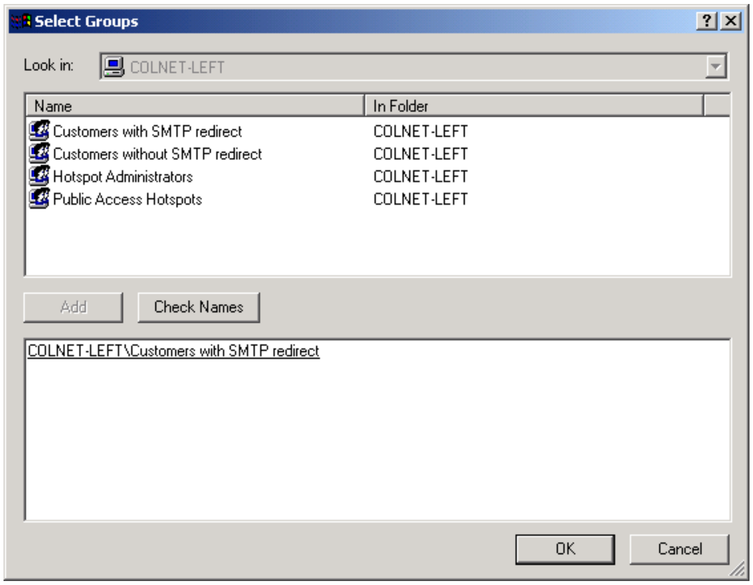
11. The *Groups* dialog box opens. Click **Add**.



The following groups are currently in this condition.

Groups:

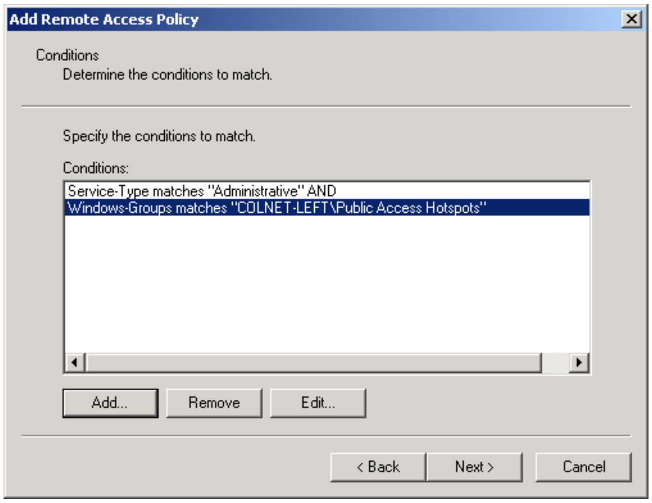
12. The *Select Groups* dialog box opens. Select **Customers with SMTP redirect**, click **Add**, and then **OK**.



Name	In Folder
Customers with SMTP redirect	COLNET-LEFT
Customers without SMTP redirect	COLNET-LEFT
Hotspot Administrators	COLNET-LEFT
Public Access Hotspots	COLNET-LEFT

COLNET-LEFT\Customers with SMTP redirect

13. Return to the *Add Remote Access Policy* dialog box and click **Next**.



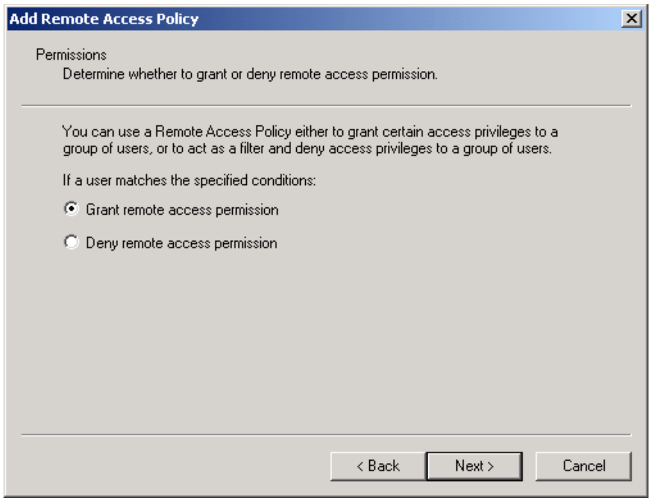
Conditions
Determine the conditions to match.

Specify the conditions to match.

Conditions:

Service-Type matches "Administrative" AND
Windows-Groups matches "COLNET-LEFT\Public Access Hotspots"

14. Select **Grant remote access permission** and click **Next**.



Permissions
Determine whether to grant or deny remote access permission.

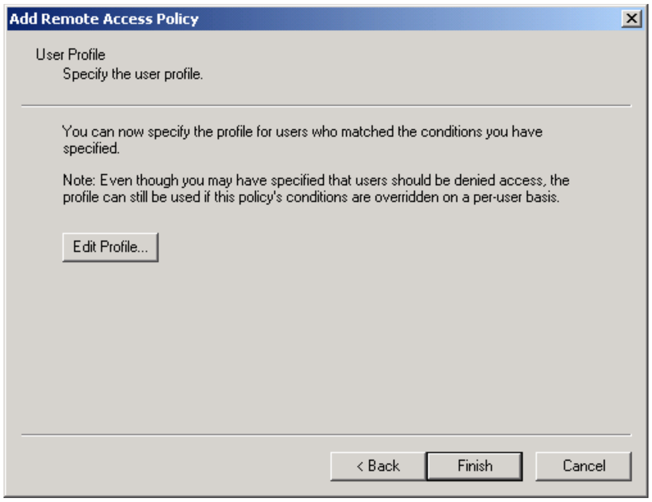
You can use a Remote Access Policy either to grant certain access privileges to a group of users, or to act as a filter and deny access privileges to a group of users.

If a user matches the specified conditions:

● Grant remote access permission

○ Deny remote access permission

15. Click **Edit Profile**.

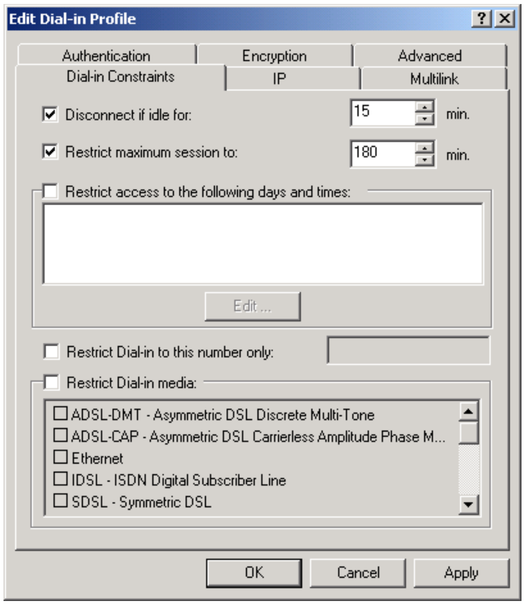


User Profile
Specify the user profile.

You can now specify the profile for users who matched the conditions you have specified.

Note: Even though you may have specified that users should be denied access, the profile can still be used if this policy's conditions are overridden on a per-user basis.

16. The **Edit-Dial-in Profile** window opens.



☑ Disconnect if idle for: 15 min.

☑ Restrict maximum session to: 180 min.

☐ Restrict access to the following days and times:

☐ Restrict Dial-in to this number only:

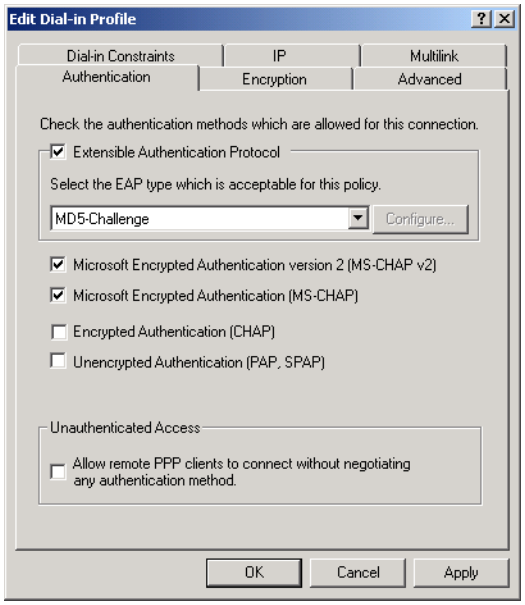
☐ Restrict Dial-in media:

☐ ADSL-DMT - Asymmetric DSL Discrete Multi-Tone
☐ ADSL-CAP - Asymmetric DSL Carrierless Amplitude Phase M...
☐ Ethernet
☐ IDSL - ISDN Digital Subscriber Line
☐ SDSL - Symmetric DSL

17. Define the maximum idle time for customer sessions by selecting **Disconnect if idle for** and setting an appropriate time.

18. Define the maximum duration for customer sessions by selecting **Restrict maximum session to** and setting an appropriate time.

19. Click the **Authentication** tab and enable the options as shown.



Check the authentication methods which are allowed for this connection.

☑ Extensible Authentication Protocol

Select the EAP type which is acceptable for this policy.

MD5-Challenge

☑ Microsoft Encrypted Authentication version 2 (MS-CHAP v2)

☑ Microsoft Encrypted Authentication (MS-CHAP)

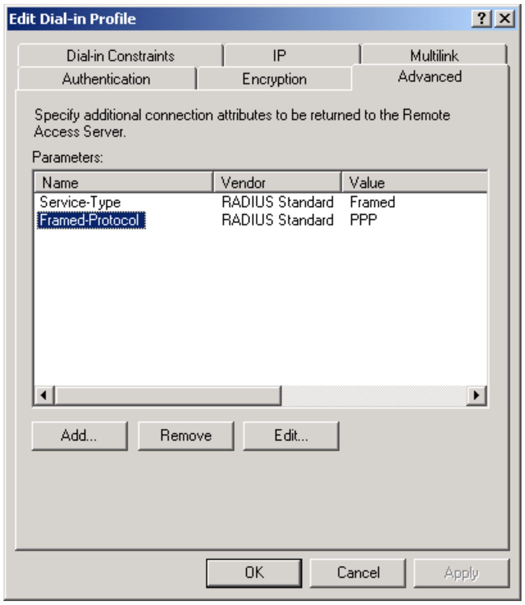
□ Encrypted Authentication (CHAP)

□ Unencrypted Authentication (PAP, SPAP)

Unauthenticated Access

□ Allow remote PPP clients to connect without negotiating any authentication method.

20. Click the **Advanced** tab.



Specify additional connection attributes to be returned to the Remote Access Server.

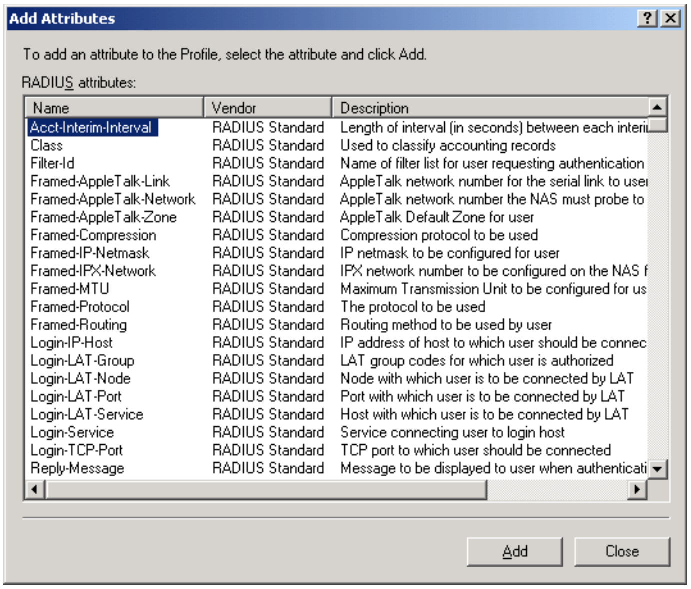
Parameters:

Name	Vendor	Value
Service-Type	RADIUS Standard	Framed
Framed-Protocol	RADIUS Standard	PPP

This tab is where you specify the values that are returned to the CN3200 when a customer is authenticated by the RADIUS server.

21. Remove all entries.

22. If you want to enable support for interim accounting updates, click **Add**. The *Add Attributes* dialog box opens.

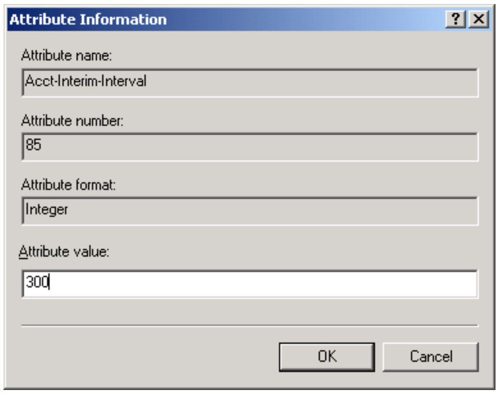


To add an attribute to the Profile, select the attribute and click Add.

RADIUS attributes:

Name	Vendor	Description
Acct-Interim-Interval	RADIUS Standard	Length of interval (in seconds) between each interi
Class	RADIUS Standard	Used to classify accounting records
Filter-Id	RADIUS Standard	Name of filter list for user requesting authentication
Framed-AppleTalk-Link	RADIUS Standard	AppleTalk network number for the serial link to user
Framed-AppleTalk-Network	RADIUS Standard	AppleTalk network number the NAS must probe to
Framed-AppleTalk-Zone	RADIUS Standard	AppleTalk Default Zone for user
Framed-Compression	RADIUS Standard	Compression protocol to be used
Framed-IP-Netmask	RADIUS Standard	IP netmask to be configured for user
Framed-IPX-Network	RADIUS Standard	IPX network number to be configured on the NAS f
Framed-MTU	RADIUS Standard	Maximum Transmission Unit to be configured for us
Framed-Protocol	RADIUS Standard	The protocol to be used
Framed-Routing	RADIUS Standard	Routing method to be used by user
Login-IP-Host	RADIUS Standard	IP address of host to which user should be connec
Login-LAT-Group	RADIUS Standard	LAT group codes for which user is authorized
Login-LAT-Node	RADIUS Standard	Node with which user is to be connected by LAT
Login-LAT-Port	RADIUS Standard	Port with which user is to be connected by LAT
Login-LAT-Service	RADIUS Standard	Host with which user is to be connected by LAT
Login-Service	RADIUS Standard	Service connecting user to login host
Login-TCP-Port	RADIUS Standard	TCP port to which user should be connected
Reply-Message	RADIUS Standard	Message to be displayed to user when authenticati

23. Select **Acct-Interim-Interval** and click **Add**. The *Attribute Information* dialog box opens.



Attribute name: Acct-Interim-Interval

Attribute number: 85

Attribute format: Integer

Attribute value: 300

24. In the **Attribute value** field, specify the reporting interval (in seconds) that the CN3200 will use to send accounting information to the RADIUS server.

25. Click **OK**.

You can now specify the attributes that will be returned after a customer is successfully authenticated. This enables you to define a number of important operating characteristics, including:

- The access list that is in use.
- Support for SMTP mail redirection.

Refer to “Creating customer profiles on the RADIUS server” on page 225 for a complete list of supported attributes.

For this example, you should create the following entries:

```
smtp-redirect=192.168.2.100
```

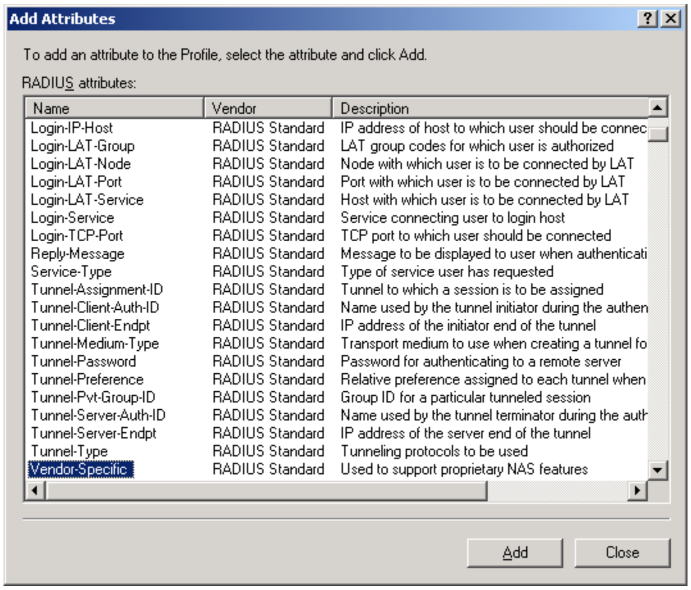
This provides access to the fictional SMTP server on 192.168.2.100. Add this when defining the **Public Access Customers (SMTP Redirect)** access policy.

```
use-access-list=cust
```

This access list was defined in the **Public Hotspot Policy**. It is activated here to provide access to the web server on 192.168.2.100.

To add each entry:

- Click **Add.** The *Add Attributes* dialog box opens.



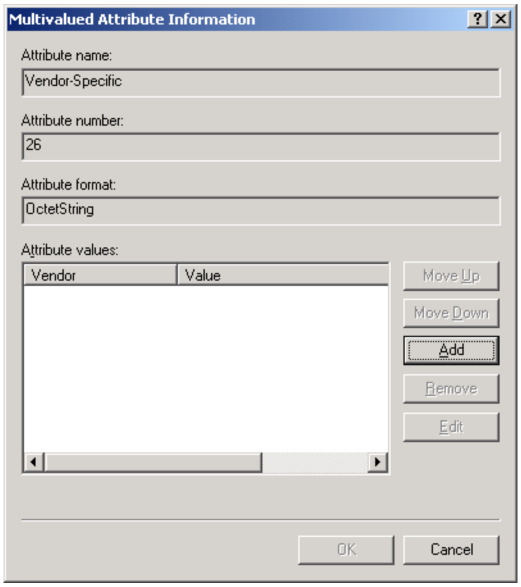
Add Attributes

To add an attribute to the Profile, select the attribute and click Add.

RADIUS attributes:

Name	Vendor	Description
Login-IP-Host	RADIUS Standard	IP address of host to which user should be connec
Login-LAT-Group	RADIUS Standard	LAT group codes for which user is authorized
Login-LAT-Node	RADIUS Standard	Node with which user is to be connected by LAT
Login-LAT-Port	RADIUS Standard	Port with which user is to be connected by LAT
Login-LAT-Service	RADIUS Standard	Host with which user is to be connected by LAT
Login-Service	RADIUS Standard	Service connecting user to login host
Login-TCP-Port	RADIUS Standard	TCP port to which user should be connected
Reply-Message	RADIUS Standard	Message to be displayed to user when authenticati
Service-Type	RADIUS Standard	Type of service user has requested
Tunnel-Assignment-ID	RADIUS Standard	Tunnel to which a session is to be assigned
Tunnel-Client-Auth-ID	RADIUS Standard	Name used by the tunnel initiator during the authen
Tunnel-Client-Endpt	RADIUS Standard	IP address of the initiator end of the tunnel
Tunnel-Medium-Type	RADIUS Standard	Transport medium to use when creating a tunnel fo
Tunnel-Password	RADIUS Standard	Password for authenticating to a remote server
Tunnel-Preference	RADIUS Standard	Relative preference assigned to each tunnel when
Tunnel-Pvt-Group-ID	RADIUS Standard	Group ID for a particular tunneled session
Tunnel-Server-Auth-ID	RADIUS Standard	Name used by the tunnel terminator during the auth
Tunnel-Server-Endpt	RADIUS Standard	IP address of the server end of the tunnel
Tunnel-Type	RADIUS Standard	Tunneling protocols to be used
Vendor-Specific	RADIUS Standard	Used to support proprietary NAS features

- Select **Vendor-Specific** and click **Add**. The *Multivalued Attribute Information* dialog box opens.



Multivalued Attribute Information

Attribute name: Vendor-Specific

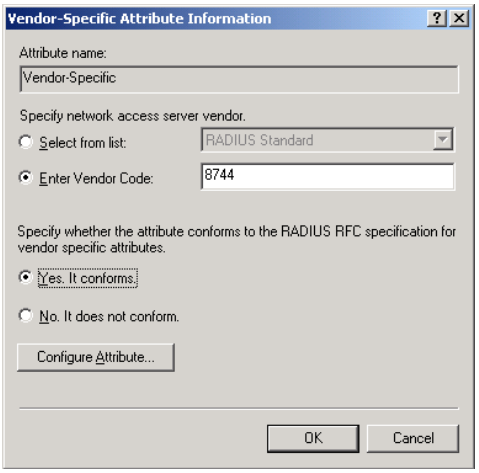
Attribute number: 26

Attribute format: OctetString

Attribute values:

Vendor	Value

- Click **Add** to add a new attribute.


Vendor-Specific Attribute Information

Attribute name:
Vendor-Specific

Specify network access server vendor.

○ Select from list: RADIUS Standard

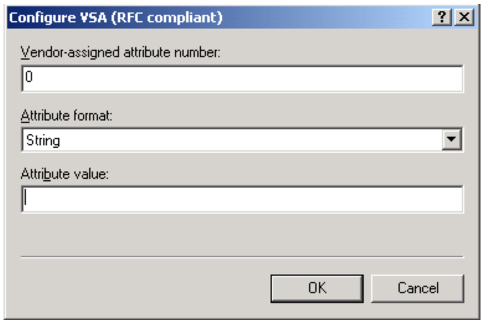
● Enter Vendor Code: 8744

Specify whether the attribute conforms to the RADIUS RFC specification for vendor specific attributes.

● Yes. It conforms.

○ No. It does not conform.

- Specify the Colubris Networks vendor code **8744** in **Enter Vendor Code**.
- Select **Yes. It conforms.**
- Click **Configure Attribute**. The *Configure VSA (RFC compliant)* dialog box opens.

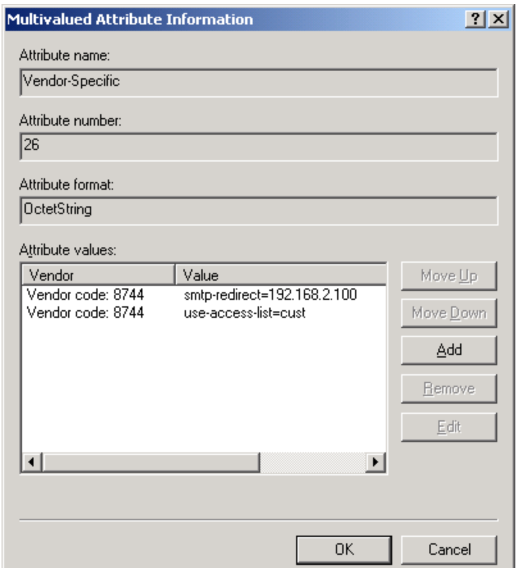

Configure VSA (RFC compliant)

Vendor-assigned attribute number:
0

Attribute format:
String

Attribute value:

- For **Vendor-assigned attribute number**, specify 0.
- For **Attribute format**, select **String.**
- For **Attribute value**, specify each of the following attributes in turn:
    - smtp-redirect=192.168.2.100
    - use-access-list=cust


Multivalued Attribute Information

Attribute name:
Vendor-Specific

Attribute number:
26

Attribute format:
OctetString

Attribute values:

Vendor	Value
Vendor code: 8744	smtp-redirect=192.168.2.100
Vendor code: 8744	use-access-list=cust

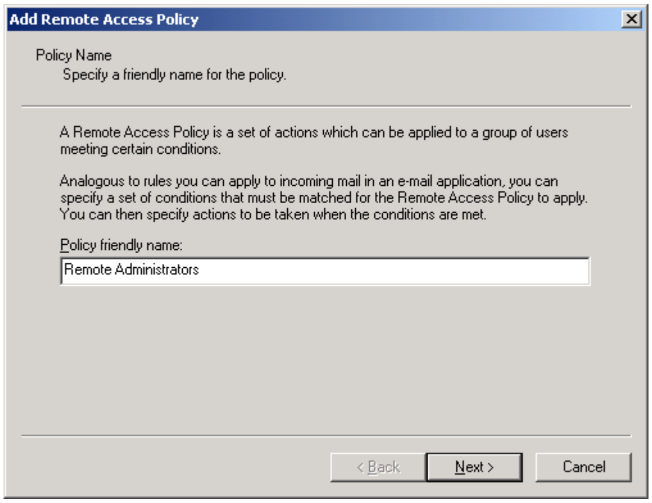
26. When done, click **OK** on all dialog boxes to return to the **Add Remote Access Policy** dialog box.
27. Click **Finish**.

Step 8: Create an access policy for CN3200 admins

This section explains how to create a remote access policy to centrally validate administrator logins via the RADIUS server instead of locally on each CN3200.

Note: *Setting up administrator profiles is optional and is not required for proper operation of this sample.*

1. Click **Remote Access Policies**.
2. On the **Action** menu, click **New remote access policy**. The *Add Remote Access Policy* dialog box opens.



Add Remote Access Policy

Policy Name

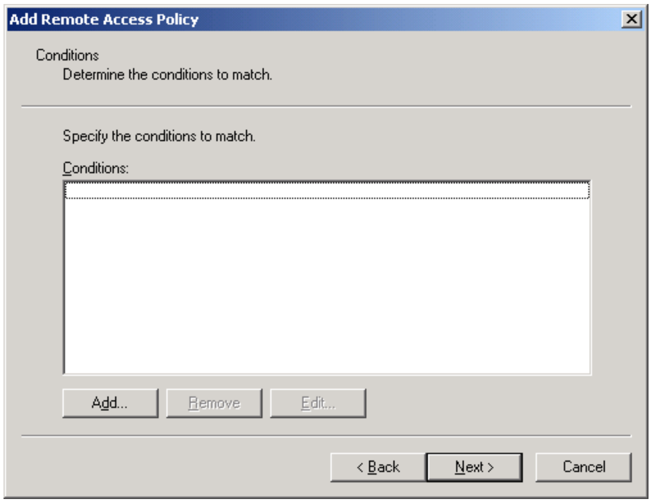
Specify a friendly name for the policy.

A Remote Access Policy is a set of actions which can be applied to a group of users meeting certain conditions.

Analogous to rules you can apply to incoming mail in an e-mail application, you can specify a set of conditions that must be matched for the Remote Access Policy to apply. You can then specify actions to be taken when the conditions are met.

Policy friendly name: Remote Administrators

3. Specify a **Policy friendly name** for the policy. For example you could use “Remote Administrators”.
4. Click **Next**. The *Add Remote Access Policy* dialog box opens.



Add Remote Access Policy

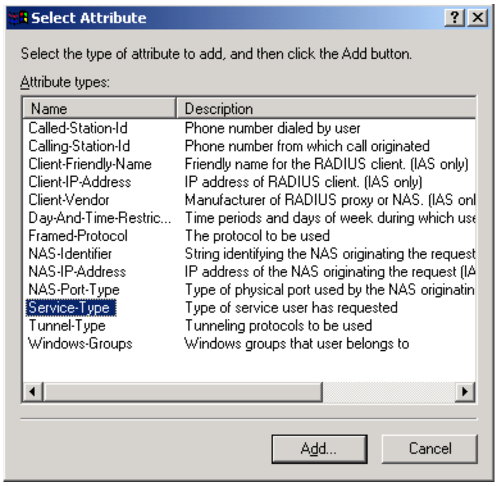
Conditions

Determine the conditions to match.

Specify the conditions to match.

Conditions:

5. Click **Add**. The *Select Attribute* dialog box opens.



Select Attribute

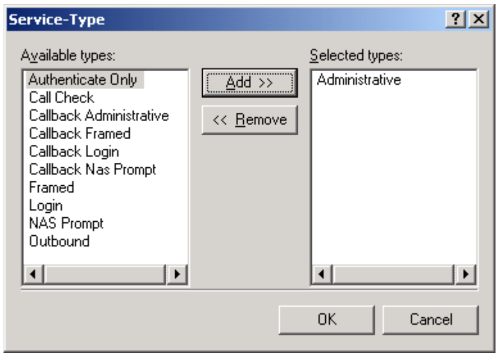
Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

6. Select **Service-Type** and click **Add.**

7. Select **Administrative**, click **Add**, then click **OK.**



Service-Type

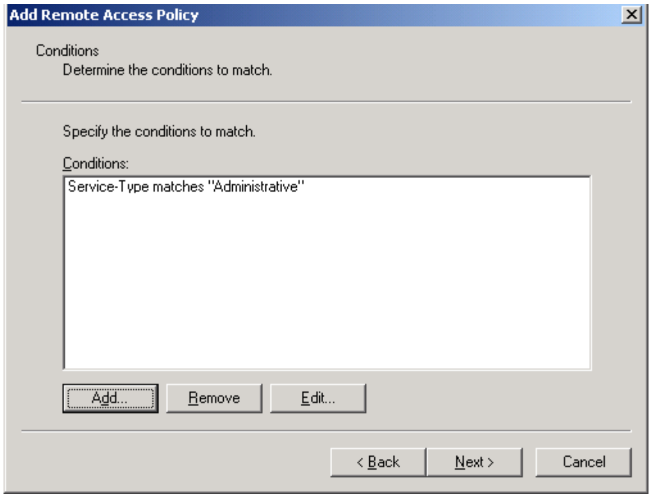
Available types:

Authenticate Only
Call Check
Callback Administrative
Callback Framed
Callback Login
Callback Nas Prompt
Framed
Login
NAS Prompt
Outbound

Selected types:

Administrative

8. Return to the *Add Remote Access Policy* dialog box.



Add Remote Access Policy

Conditions
Determine the conditions to match.

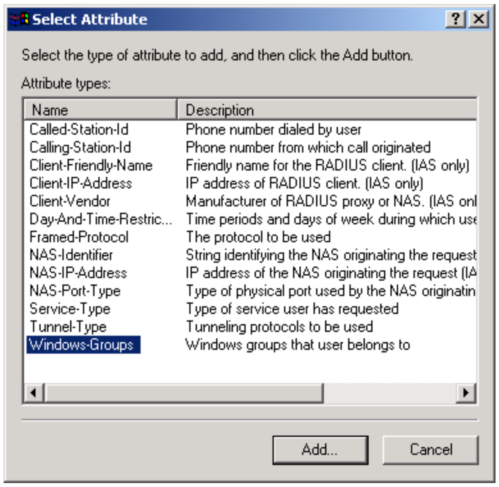
Specify the conditions to match.

Conditions:

Service-Type matches "Administrative"

9. Click **Add**. The *Select Attribute* dialog box opens.

10. Select **Windows-Groups** and click **Add**.

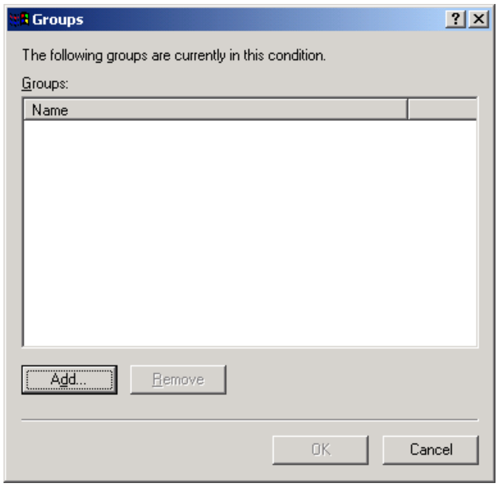


Select the type of attribute to add, and then click the Add button.

Attribute types:

Name	Description
Called-Station-Id	Phone number dialed by user
Calling-Station-Id	Phone number from which call originated
Client-Friendly-Name	Friendly name for the RADIUS client. (IAS only)
Client-IP-Address	IP address of RADIUS client. (IAS only)
Client-Vendor	Manufacturer of RADIUS proxy or NAS. (IAS onl
Day-And-Time-Restric...	Time periods and days of week during which use
Framed-Protocol	The protocol to be used
NAS-Identifier	String identifying the NAS originating the request
NAS-IP-Address	IP address of the NAS originating the request (IA
NAS-Port-Type	Type of physical port used by the NAS originatin
Service-Type	Type of service user has requested
Tunnel-Type	Tunneling protocols to be used
Windows-Groups	Windows groups that user belongs to

11. The *Groups* dialog box opens. Click **Add**.

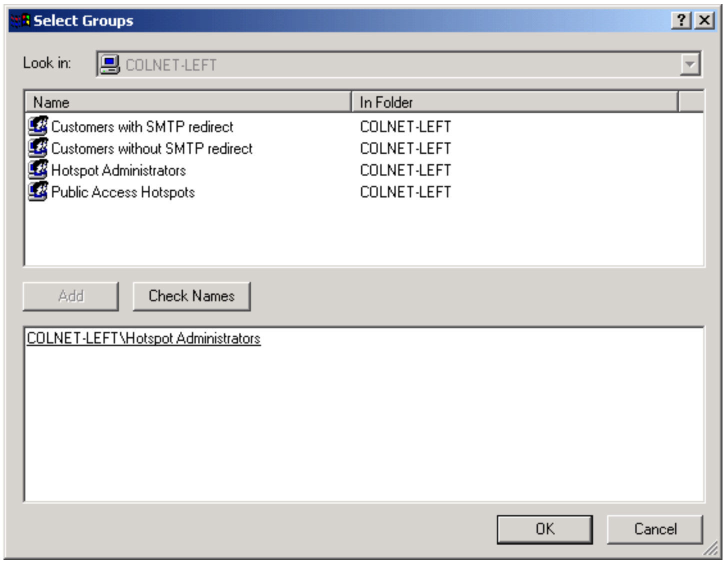


The following groups are currently in this condition.

Groups:

Name

12. The *Select Groups* dialog box opens. Select **Hotspot Administrators**, click **Add** and then **OK**.

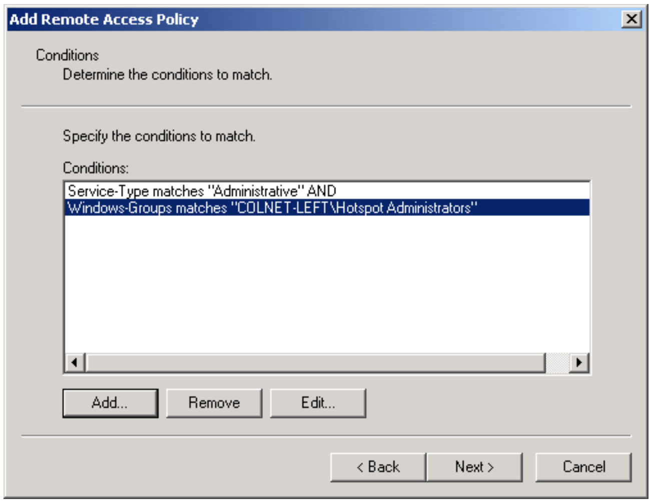


Look in: COLNET-LEFT

Name	In Folder
Customers with SMTP redirect	COLNET-LEFT
Customers without SMTP redirect	COLNET-LEFT
Hotspot Administrators	COLNET-LEFT
Public Access Hotspots	COLNET-LEFT

COLNET-LEFT\Hotspot Administrators

13. Return to the *Add Remote Access Policy* dialog box and click **Next**.



Add Remote Access Policy

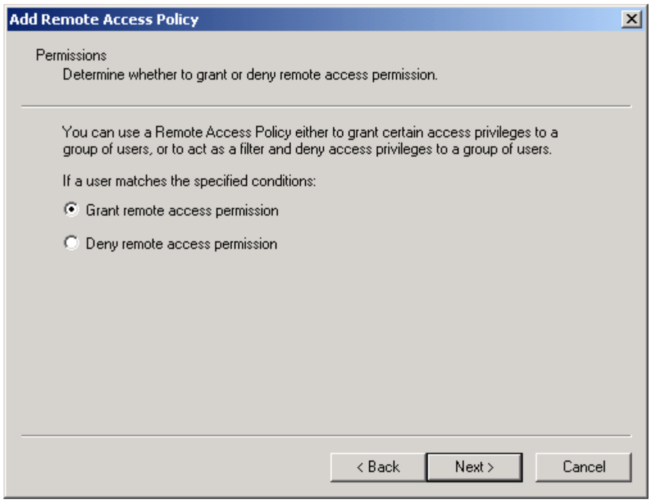
Conditions
Determine the conditions to match.

Specify the conditions to match.

Conditions:

Service-Type matches "Administrative" AND
Windows-Groups matches "COLNET-LEFT\Hotspot Administrators"

14. Select **Grant remote access permission** and click **Next**.



Add Remote Access Policy

Permissions
Determine whether to grant or deny remote access permission.

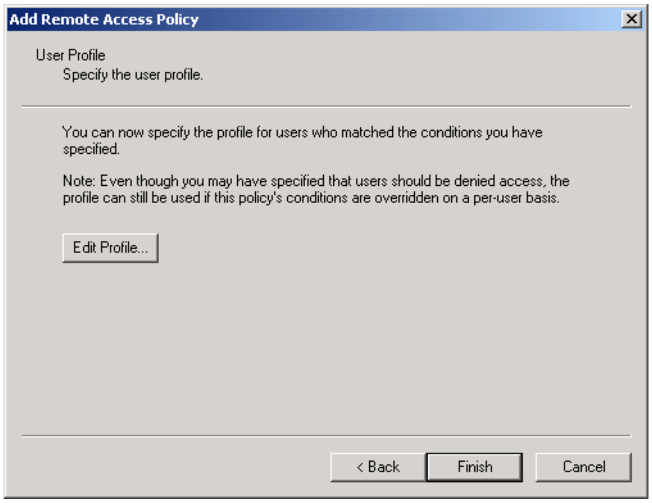
You can use a Remote Access Policy either to grant certain access privileges to a group of users, or to act as a filter and deny access privileges to a group of users.

If a user matches the specified conditions:

● Grant remote access permission

○ Deny remote access permission

15. Click **Edit Profile**.



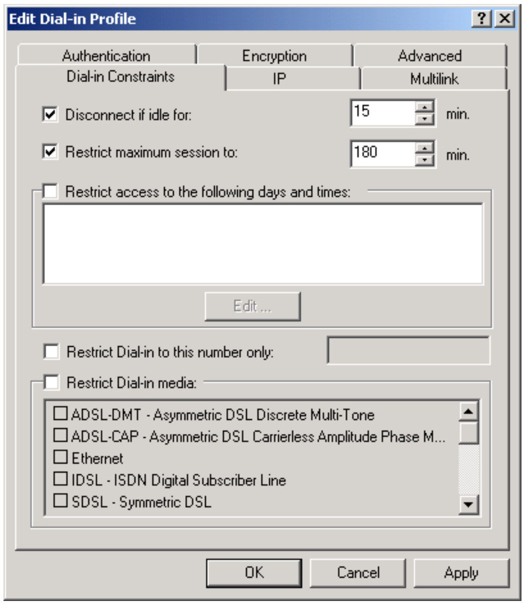
Add Remote Access Policy

User Profile
Specify the user profile.

You can now specify the profile for users who matched the conditions you have specified.

Note: Even though you may have specified that users should be denied access, the profile can still be used if this policy's conditions are overridden on a per-user basis.

16. The **Edit-Dial-in Profile** window opens.



Edit Dial-in Profile

☑ Disconnect if idle for: 15 min.

☑ Restrict maximum session to: 180 min.

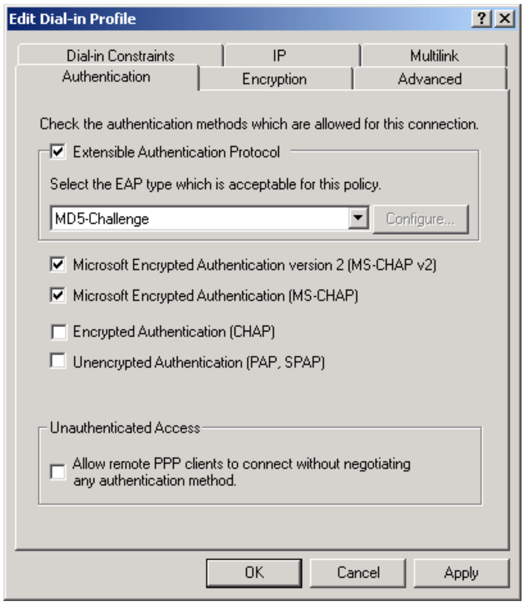
□ Restrict access to the following days and times:

□ Restrict Dial-in to this number only:

□ Restrict Dial-in media:

- □ ADSL-DMT - Asymmetric DSL Discrete Multi-Tone
- □ ADSL-CAP - Asymmetric DSL Carrierless Amplitude Phase M...
- □ Ethernet
- □ IDSL - ISDN Digital Subscriber Line
- □ SDSL - Symmetric DSL

17. Click the **Authentication** tab and enable the options as shown.



Edit Dial-in Profile

Check the authentication methods which are allowed for this connection.

☑ Extensible Authentication Protocol

Select the EAP type which is acceptable for this policy.

MD5-Challenge

☑ Microsoft Encrypted Authentication version 2 (MS-CHAP v2)

☑ Microsoft Encrypted Authentication (MS-CHAP)

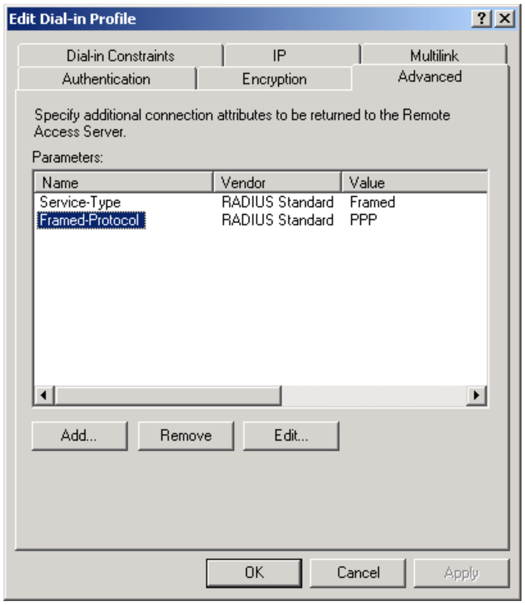
□ Encrypted Authentication (CHAP)

□ Unencrypted Authentication (PAP, SPAP)

Unauthenticated Access

□ Allow remote PPP clients to connect without negotiating any authentication method.

18. Click the **Advanced** tab.



Specify additional connection attributes to be returned to the Remote Access Server.

Parameters:

Name	Vendor	Value
Service-Type	RADIUS Standard	Framed
Framed-Protocol	RADIUS Standard	PPP

19. Remove all entries.

20. Click **OK**.

21. Click **Finish**.

Step 9: Install and configure the CN3200

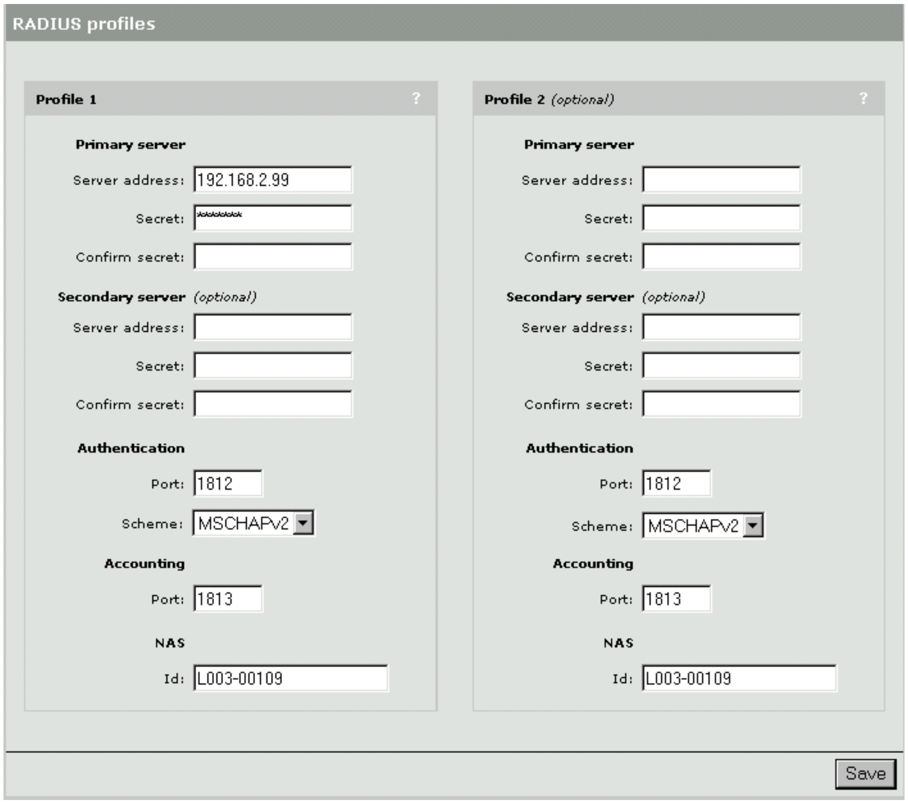
Assign a static address

1. On the **Network** menu, click **Ports.**
2. Click **Internet port** in the table.
3. Select **Static** and then click **Configure**.
4. Make the following settings:
   - IP address: Assign an address. For this example, use the address: **192.168.2.1**
   - Address mask: Assign an appropriate mask. For this example, use the mask: 255.255.255.0.
   - Default gateway: Leave blank. In a real setup this would be set to the address of the router providing access to the Internet.
   - In a real setup you would also need to define DNS settings.

Configure RADIUS settings

The CN3200 must be configured to communicate with the RADIUS server. For a detailed explanation of configuration issues, see Chapter 16: “Customizing CN3200 and customer settings” on page 207.

1. On the **Security** menu, click **RADIUS**. The *RADIUS settings* page opens.



RADIUS profiles

Profile 1

Primary server

Server address: 192.168.2.99

Secret: *******

Confirm secret:

Secondary server (optional)

Server address:

Secret:

Confirm secret:

Authentication

Port: 1812

Scheme: MSCHAPv2

Accounting

Port: 1813

NAS

Id: L003-00109

Profile 2 (optional)

Primary server

Server address:

Secret:

Confirm secret:

Secondary server (optional)

Server address:

Secret:

Confirm secret:

Authentication

Port: 1812

Scheme: MSCHAPv2

Accounting

Port: 1813

NAS

Id: L003-00109

2. Configure the following parameters:
   - Primary server address: Specify the address of Server 1. For this example, use the address: 192.168.2.99

- Primary server secret: Specify the secret you defined on when configuring Steel-Belted Radius. For this example, use the secret: **secret**

3. Click **Save**.
4. Click **Authentication**. The *Authentications settings* page opens.
5. In the **Customers** box, set **Authenticate via** to **RADIUS profile 1**.
6. Configure the **CN3200** box as follows:
   - **Authenticate via**: Set to **RADIUS profile 1**.
   - **Login name**: Set to **hotspot**.
   - **Password**: Set to **hotspot**.
7. Enable **Authenticate customers with 802.1x**.
8. Click **Save.** The CN3200 will attempt to connect to the Microsoft Radius server. If successful, the status light will change from red to green.

Step 10: Install Server 2

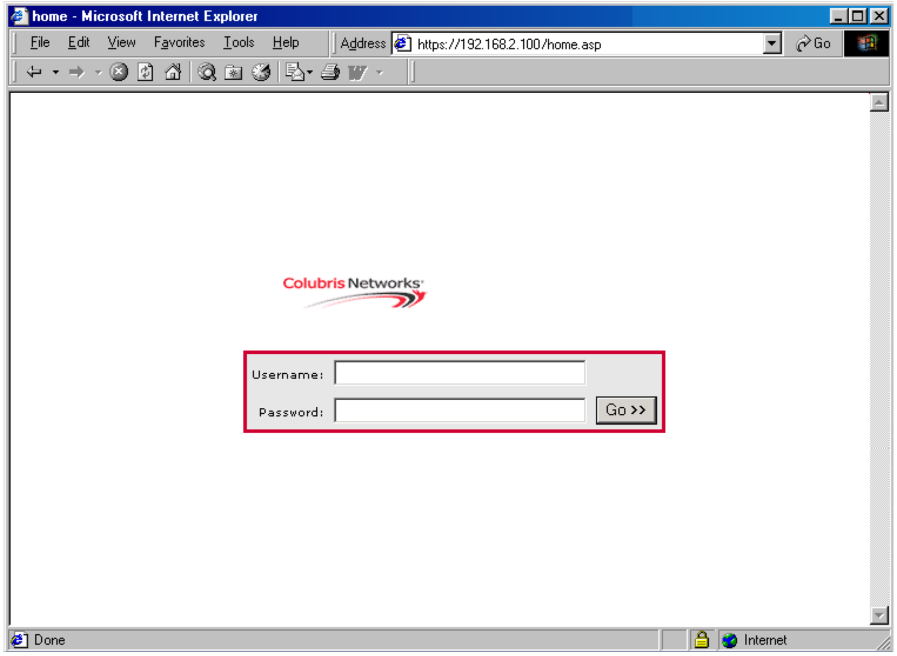
This example assumes Windows 2000 and IIS are installed on Server 2. You can any another operating system and web server.

1. Install Windows 2000 Professional, Server, or Advanced Server and then install Service Pack 3.
2. Make sure that IIS is running.
3. Connect Server 2 to the hub and assign a static IP address to it. For this example, use the address 192.168.2.100.

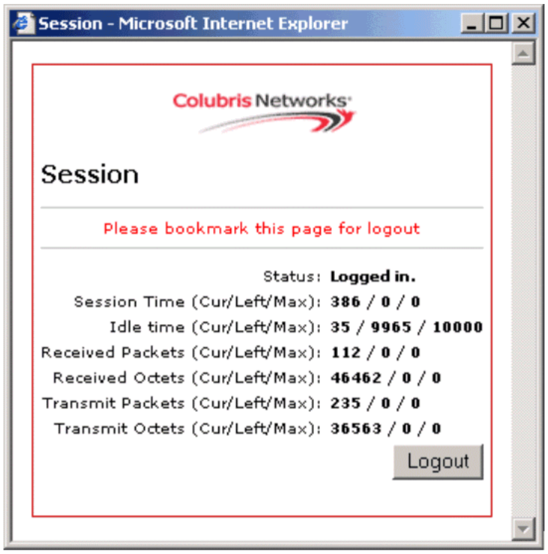
Step 11: Test the installation

To test the installation, use the client station to log onto the public access interface. For this to work, the CN3200 must be configured as the client's default gateway. If you set up your equipment to match the setup of this example, this is automatic. If not, adjust the configuration of the client accordingly.

1. Start the client station's web browser and enter the IP address of Server 2 (192.168.2.100).
2. The CN3200 should intercept the HTTTP request and display the login page. Depending on the type of certificate that is installed on the CN3200 you may see a security warning first.


home - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://192.168.2.100/home.asp
Go
Colubris Networks
Username:
Password:
Go >>
Done
Internet

3. To login, specify **customer1** as both the username and password. The CN3200 session page should open.



Session

Please bookmark this page for logout

Status: **Logged in.**
Session Time (Cur/Left/Max): **386 / 0 / 0**
Idle time (Cur/Left/Max): **35 / 9965 / 10000**
Received Packets (Cur/Left/Max): **112 / 0 / 0**
Received Octets (Cur/Left/Max): **46462 / 0 / 0**
Transmit Packets (Cur/Left/Max): **235 / 0 / 0**
Transmit Octets (Cur/Left/Max): **36563 / 0 / 0**

4. You should automatically be redirected to the web server on Server 2.

Testing administrator logins

If you configured administrator accounts on the RADIUS server, you can test them now as follows:

To test the accounts that were setup to validate administrator logins using the RADIUS server, do the following:

1. Open the CN3200 management tool with your web browser.
2. On the main menu, click **Management**. The *Management tool configuration* page opens.
3. For **Authenticate via** select **RADIUS profile 1**.
4. Click **Save** and then Logout.
5. Login with username and password **admin1**.

Chapter 20
Experimenting with NOC authentication

This chapter provides a sample setup that illustrates how the NOC authentication feature works and lets you experiment with it. This sample is not a complete working implementation, but rather a test setup that you can use to become familiar with the feature.

The sample setup in this chapter functions from the command-line using VPScript. The ASP version of the script can be used as a starting point for porting or integrating the NOC authentication code into the remote access page on a production system.

IMPORTANT: Before reading this chapter you should familiarize yourself with the concepts discussed in Chapter 15 and Chapter 16. Pay special attention to all topics related to the remote login page and NOC authentication.

Overview

This chapter lets you use the sample setup presented in Chapter 17 to evaluate the NOC authentication feature. For a description of this feature see page 176.

Evaluation of the NOC authentication feature is accomplished using a VBScript program that lets you send authentication requests to the CN3200 using an SSL session. This program demonstrates the functionality that would be required in a remote login page.

A command line interface is used to run the program. No remote login page is provided.

About the certificates

To use NOC authentication you need the following three certificates that are already generated and included with the backend files.

- **www.noc-cn3000.com.pfx:** Installed on the CN3200 and used to secure the session it establishes with the VBScript application on the web server. It is signed by **noc-ca.crt**.
- **noc-ca.crt**: Installed on the web server.
- **noc-client.pfx**: Installed on the web server and used by the VBScript program to secure the session it establishes with the CN3200. It is signed by **noc-ca.crt**.

Requirements

- Windows 2000 Server, Advanced Server (with Service Pack 3) or Windows XP, and all recommended updates
- Internet Explorer 6.0 service pack 1

Hardware

- a network hub
- a second network hub or a cross-over cable
- two computers capable of running Windows 2000 Professional, Server or Advanced Server with Service Pack 3, or Windows XP with Service Pack 1
- a CN3200
- a third computer with a JavaScript-enabled web browser, with or standard Ethernet adapter

Skills

- Familiarity with the installation and operation of TCP/IP-based networks.
- Basic knowledge of Windows 2000, including how to use a Windows command-line session.

Skills

- Familiarity with the installation and operation of TCP/IP-based networks.
- Basic knowledge of Windows 2000, including how to use a Windows command-line session.

Equipment setup

This section illustrates the hardware setup that was used to create the sample configuration described in this chapter. If you duplicate this setup, you will not have to change any of the IP addresses supplied in the example.

Topology

This example uses the same equipment setup presented in Chapter 17. You should follow the instructions in Chapter 17 to install this sample and get it working.

For your reference th topology is:

Step 1: Configure the CN3000

In this step you will install an SSL certificate on the CN3200 and enable NOC authentication. The certificate has already been created and can be found in the backend folder.

Install an SSL certificate on the CN3200

1. Login to the management tool and go to **Security** > **Certificates**.
2. In the **[SSL] Web Server Certificates** box, click **Browse**.
3. Select the following folder on the CN3200 CD-ROM: **\backend\winhttpauth\www.noc-cn3000.com.pfx**
4. In the **Password** field, specify **www.noc-cn3000.com**.
5. Click **Install**.
6. The CN3200 will install the certificate. The CN3200 will now be reachable as www.noc-cn3000.com. (This is an alias to the IP address of the CN3200's Internet port.)

Enable NOC authentication

1. Click **Security**, then click **Authentication**.
2. Click the **Advanced Settings** button.
3. Enable the **NOC authentication** feature.
4. Add the IP address of the Server 1 (192.168.2.99) to the **Allowed Addresses** box.
5. Click **Save**.

Step 2: Configure the RADIUS profile for the CN3200

Define the profile

In the RADIUS profile for the CN3200, define the following:

```
ssl-noc-certificate= https://192.168.2.99/demo-php/upload/noc-
client.crt
ssl-noc-ca-certificate= https://192.168.2.99/demo-php/upload/noc-
ca.crt
```

These files are included as part of the backend example.

Force authentication

For the CN3200 to authenticate to the RADIUS server so it can retrieve the new settings youjust added to the profile.

1. Open the management tool.
2. Go to **Security** > **Authentication**.
3. Click the **Force Authentication** button. The CN3200 will authenticate itself and retrieve the newly configured settings.

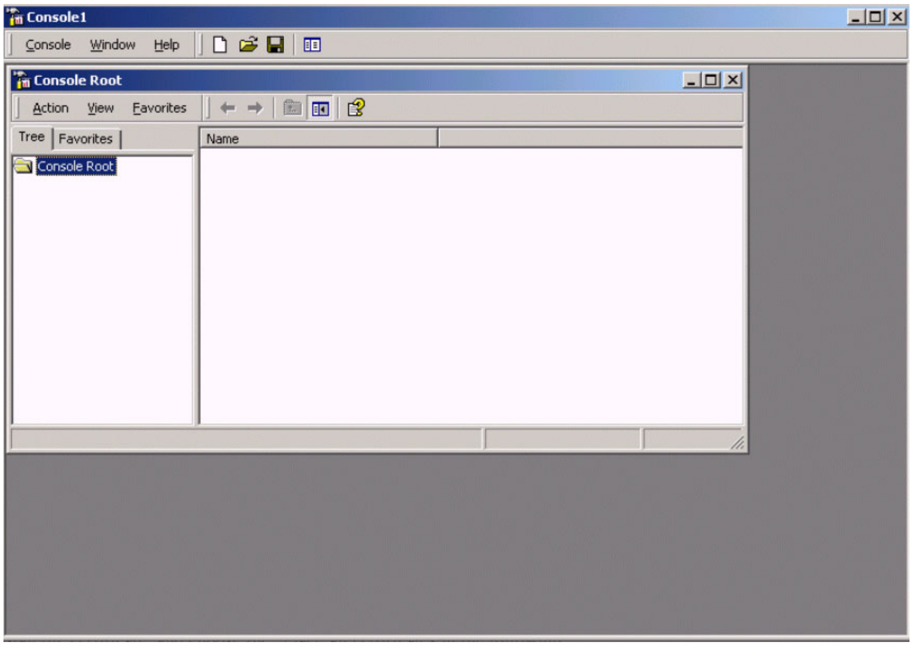
Step 3: Configure Server 1

Important: *Do not use the certificates supplied with this example as part of a production system. You should replace these certificates with your own, or remove them from the list of Trusted Root Certificate Authorities to prevent your computer from trusting web sites using certificates signed by the private key present in noc-ca.pfx. As this key is provided as an part of an example, it should not be considered as a secret key.*

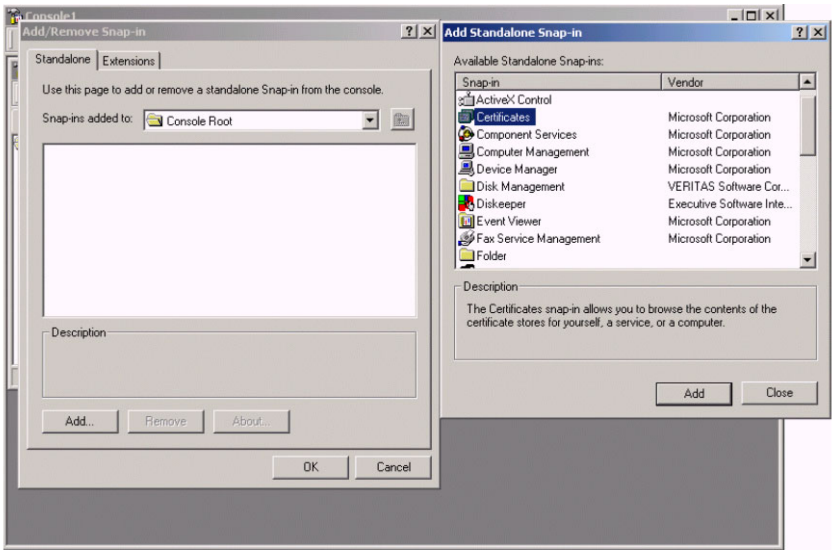
Install certificates

The certificate **noc-ca.crt** must be imported into the **Trusted Root Certification Authorities** certificate store on Server 1. This is done using Microsoft Management Console:

1. Login to Windows as administrator.
2. Click **Start**, then click **Run**.
3. Specify **mmc** and press enter.



4. On the **Console** menu, click **Add/Remove Snap-in**.



Use this page to add or remove a standalone Snap-in from the console.

Snap-ins added to: Console Root

Available Standalone Snap-ins:

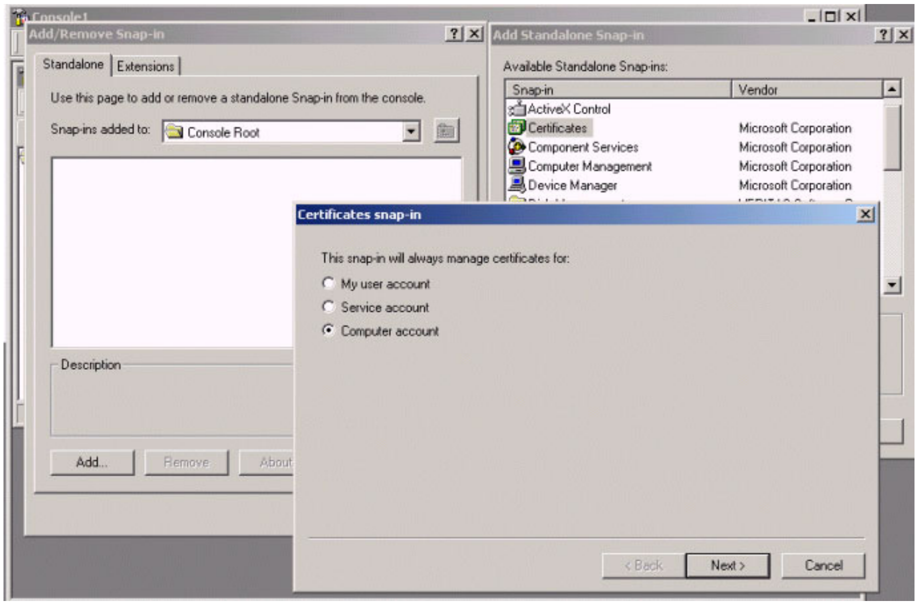
Snap-in	Vendor
ActiveX Control	
Certificates	Microsoft Corporation
Component Services	Microsoft Corporation
Computer Management	Microsoft Corporation
Device Manager	Microsoft Corporation
Disk Management	VERITAS Software Cor...
Diskeeper	Executive Software Inte...
Event Viewer	Microsoft Corporation
Fax Service Management	Microsoft Corporation
Folder	

The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a service, or a computer.

5. Click **Add**.

6. Click **Certificates,** then click **Add.**

7. Then select **Computer account**.



Use this page to add or remove a standalone Snap-in from the console.

Snap-ins added to: Console Root

Available Standalone Snap-ins:

Snap-in	Vendor
ActiveX Control	
Certificates	Microsoft Corporation
Component Services	Microsoft Corporation
Computer Management	Microsoft Corporation
Device Manager	Microsoft Corporation

This snap-in will always manage certificates for:

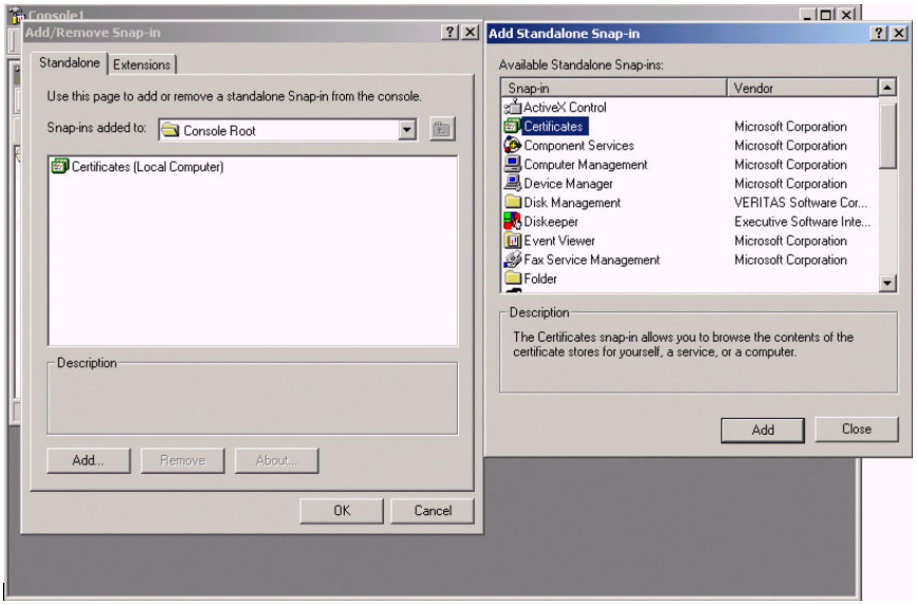
○ My user account

○ Service account

● Computer account

8. Click **Next**.

9. Choose **Local Computer** and click **Finish**.



Use this page to add or remove a standalone Snap-in from the console.

Snap-ins added to: Console Root

Certificates (Local Computer)

Description

Available Standalone Snap-ins:

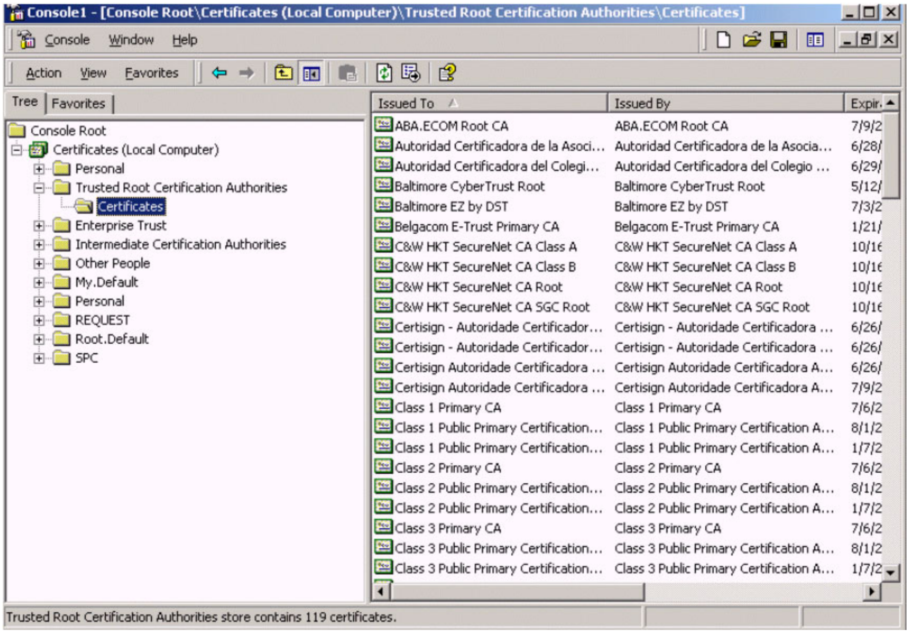
Snap-in	Vendor
ActiveX Control	
Certificates	Microsoft Corporation
Component Services	Microsoft Corporation
Computer Management	Microsoft Corporation
Device Manager	Microsoft Corporation
Disk Management	VERITAS Software Cor...
Diskeeper	Executive Software Inte...
Event Viewer	Microsoft Corporation
Fax Service Management	Microsoft Corporation
Folder	

Description

The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a service, or a computer.

10. Click **Close** and **OK** to return to the mmc console window.

11. Open **Certificates** under **Trusted Root Certification Authorities.**

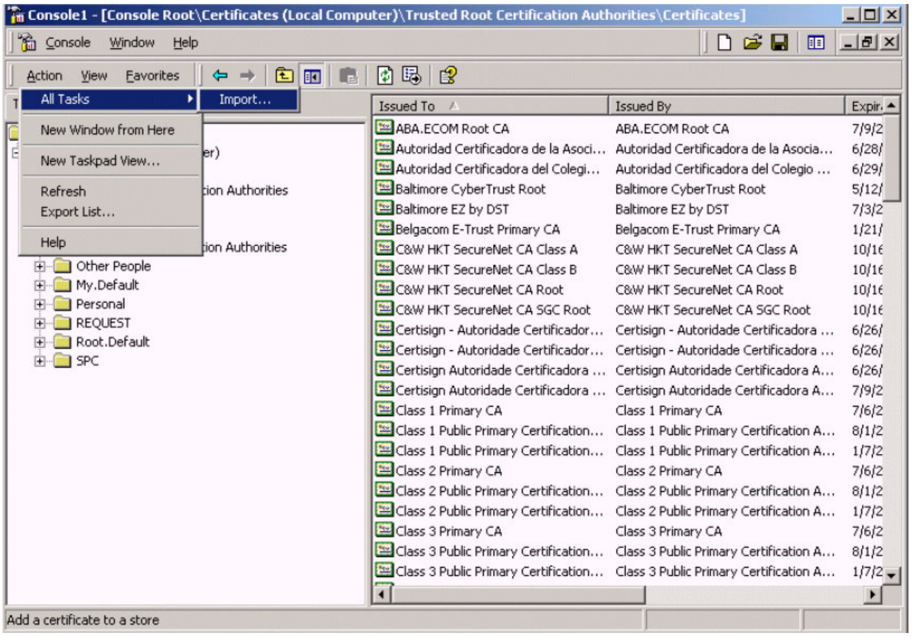

Console1 - [Console Root\Certificates (Local Computer)\Trusted Root Certification Authorities\Certificates]
Console
Window
Help
Action
View
Favorites
Tree
Favorites

Console Root
- Certificates (Local Computer)
  - Personal
  - Trusted Root Certification Authorities
    - Certificates
  - Enterprise Trust
  - Intermediate Certification Authorities
  - Other People
  - My.Default
  - Personal
  - REQUEST
  - Root.Default
  - SPC

Issued To	Issued By	Expir.
ABA.ECOM Root CA	ABA.ECOM Root CA	7/9/2
Autoridad Certificadora de la Asoci...	Autoridad Certificadora de la Asocia...	6/28/
Autoridad Certificadora del Colegi...	Autoridad Certificadora del Colegio ...	6/29/
Baltimore CyberTrust Root	Baltimore CyberTrust Root	5/12/
Baltimore EZ by DST	Baltimore EZ by DST	7/3/2
Belgacom E-Trust Primary CA	Belgacom E-Trust Primary CA	1/21/
C&W HKT SecureNet CA Class A	C&W HKT SecureNet CA Class A	10/16
C&W HKT SecureNet CA Class B	C&W HKT SecureNet CA Class B	10/16
C&W HKT SecureNet CA Root	C&W HKT SecureNet CA Root	10/16
C&W HKT SecureNet CA SGC Root	C&W HKT SecureNet CA SGC Root	10/16
Certisign - Autoridade Certificador...	Certisign - Autoridade Certificadora ...	6/26/
Certisign - Autoridade Certificador...	Certisign - Autoridade Certificadora ...	6/26/
Certisign Autoridade Certificadora ...	Certisign Autoridade Certificadora A...	6/26/
Certisign Autoridade Certificadora ...	Certisign Autoridade Certificadora A...	7/9/2
Class 1 Primary CA	Class 1 Primary CA	7/6/2
Class 1 Public Primary Certification...	Class 1 Public Primary Certification A...	8/1/2
Class 1 Public Primary Certification...	Class 1 Public Primary Certification A...	1/7/2
Class 2 Primary CA	Class 2 Primary CA	7/6/2
Class 2 Public Primary Certification...	Class 2 Public Primary Certification A...	8/1/2
Class 2 Public Primary Certification...	Class 2 Public Primary Certification A...	1/7/2
Class 3 Primary CA	Class 3 Primary CA	7/6/2
Class 3 Public Primary Certification...	Class 3 Public Primary Certification A...	8/1/2
Class 3 Public Primary Certification...	Class 3 Public Primary Certification A...	1/7/2

Trusted Root Certification Authorities store contains 119 certificates.

12. On the **Action** menu, click **All Tasks** > **Import**.



Issued To	Issued By	Expir.
ABA.ECOM Root CA	ABA.ECOM Root CA	7/9/2
Autoridad Certificadora de la Asoci...	Autoridad Certificadora de la Asocia...	6/28/
Autoridad Certificadora del Colegi...	Autoridad Certificadora del Colegio ...	6/29/
Baltimore CyberTrust Root	Baltimore CyberTrust Root	5/12/
Baltimore EZ by DST	Baltimore EZ by DST	7/3/2
Belgacom E-Trust Primary CA	Belgacom E-Trust Primary CA	1/21/
C&W HKT SecureNet CA Class A	C&W HKT SecureNet CA Class A	10/16
C&W HKT SecureNet CA Class B	C&W HKT SecureNet CA Class B	10/16
C&W HKT SecureNet CA Root	C&W HKT SecureNet CA Root	10/16
C&W HKT SecureNet CA SGC Root	C&W HKT SecureNet CA SGC Root	10/16
Certisign - Autoridade Certificador...	Certisign - Autoridade Certificadora ...	6/26/
Certisign - Autoridade Certificador...	Certisign - Autoridade Certificadora ...	6/26/
Certisign Autoridade Certificadora ...	Certisign Autoridade Certificadora A...	6/26/
Certisign Autoridade Certificadora ...	Certisign Autoridade Certificadora A...	7/9/2
Class 1 Primary CA	Class 1 Primary CA	7/6/2
Class 1 Public Primary Certification...	Class 1 Public Primary Certification A...	8/1/2
Class 1 Public Primary Certification...	Class 1 Public Primary Certification A...	1/7/2
Class 2 Primary CA	Class 2 Primary CA	7/6/2
Class 2 Public Primary Certification...	Class 2 Public Primary Certification A...	8/1/2
Class 2 Public Primary Certification...	Class 2 Public Primary Certification A...	1/7/2
Class 3 Primary CA	Class 3 Primary CA	7/6/2
Class 3 Public Primary Certification...	Class 3 Public Primary Certification A...	8/1/2
Class 3 Public Primary Certification...	Class 3 Public Primary Certification A...	1/7/2

13. Click **Next**.

14. Click **Browse**, the open the following file on the CN3200's CD-ROM: **\backend\winhttpauth\noc-ca.pfx**

15. Click **Next**.

16. Specify the following password to unlock the file: **noc-ca**.

Next

Import **noc-client.pfx** into the **Personal** certificate store using the same procedure. The password to unlock noc-client.pfx file is **noc-client**.

When done, click Exit on the console and save the settings of mmc.

Verifying that winhttpcertcfg.exe is installed

Users do not automatically gain access to the private key imported from noc-client.pfx. To grant access, winhttpcertcfg.exe must be executed on a per user basis.

To check if winhttpcertcfg.exe is installed on the server, do the following:

1. Open a command line session.

2. Execute **winhttpcrtcfg.exe**.

3. If you get an error, it means winhttp management tools are not installed, or are not in your path. If you cannot find them on your computer, you can download the Windows 2003 Server Resource Kit Tools at:

   http://www.microsoft.com/downloads/details.aspx?familyid=9d467a69-57ff-4ae7-96ee-b18c4790cffd&displaylang=en

   Note: *This resource kit will only install on Windows XP SP1 or Windows 2003 Server. Use the procedure that follows to install on Windows 2000 SP3.*

4. One the Winhttp SDK has been installed, launch a console-mode session, and go into the following folder:

```
C:\Program Files\WinHTTP 5.0 SDK\tools
```

Installing on Windows 2000 SP3

To complete this task you must have the Microsoft Windows Installer (msiexec.exe) installed on your system. If it is not present, you can download it here:

http://www.microsoft.com/downloads/details.aspx?FamilyID=4b6140f9-2d36-4977-8 fa1-6f8a0f5dca8f&DisplayLang=en#filelist

1. Open a win32 console session.
2. Go into the directory that rktools.exe was downloaded into.
3. Run the command:

   ```
   rktools /C
   ```

   You will be prompted for a temporary directory name.

   Once the extraction process is complete, the following files will be available in the temporary directory:

   ```
   rktools.msi
   rktools_p.cab
   rktools_s.cab
   ```

4. Go to the temporary directory.
5. Run the command:

   ```
   msiexec /a rktools.msi
   ```

   You will be prompted for a destination directory name.

   Once the command will be completed, all the files from the ressource kit will be present in the Program Files\Windows Resource Kits\Tools directory that is created in the destination directory, including winhttpcertcfg.exe and winhttptracecfg.exe.

Granting access to the private key for noc-client

Using winhttpcertcfg.exe, you need to grant access to the private key imported from noc-client.pfx to the application that will send customer login information to the CN3200. In this example, access needs to be granted to two accounts

- The VBscript application will be run under the administrator account, so access needs to be granted to the administrator.
- (This step only applies if you are using IIS.) The account used to run IIS also needs access to the certificate. This account is IWAM_COMPUTER, where COMPUTER is replaced by the windows network name assigned to Server 1.
- Create access by running the command:

```
winhttpcertcfg -g  -c LOCAL_MACHINE\My -s "Test-Only client
certificate for demo" -a Administrator
Microsoft (R) WinHTTP Certificate Configuration Tool
Copyright (C) Microsoft Corporation 2001.

Matching certificate:
E=support@colubris.com
CN=Test-Only Client certificate for demo
OU=Research & Development
O=Colubris Networks Inc.
L=Laval
S=Quebec
C=CA

Granting private key access for account:
    COMPUTER\Administrator
```

To see the list of accounts that have been granted access to the privare key:

```
winhttpcertcfg -l  -c LOCAL_MACHINE\My -s "Test-Only client
certificate for demo"
```

```
Microsoft (R) WinHTTP Certificate Configuration Tool
Copyright (C) Microsoft Corporation 2001.

Matching certificate:
E=support@colubris.com
CN=Test-Only Client certificate for demo
OU=Research & Development
O=Colubris Networks Inc.
L=Laval
S=Quebec
C=CA

Additional accounts and groups with access to the private key
include:
    \Everyone
    NT AUTHORITY\SYSTEM
    BUILTIN\Administrators
    COMPUTER\Administrator
```

Access for the three other accounts is automatically added by **`winhttpcertcfg`**.

Use the same procedure to add access for **IWAM_COMPUTER**.

Configuring the hosts file on Server 1

Now that a new SSL certificate is installed on the CN3200, the domain name assigned to its Internet port is **www.noc-cn3000.com**. In order for requests from the VBScript application to successfully reach the CN3200, this name must be added to the WINNT\system32\drivers\etc\hosts file. This ensures that the CN3200's domain name will be resolved to the actual IP address of the Internet port on the CN3000. The host file is located in: **\winnt\system32\drivers\etc\hosts**.

Another option

An alternative to updating the hosts file or to adding the name of the CN3000 into your DNS server would be to uncomment the following line in the script:

HttpsSession.Option(WinHttpRequestOption_SslErrorIgnoreFlags)=4096

This will prevent the script from exiting on error when attempting to connect to a CN3000 using its IP address instead of its DNS name."

Experimenting with noc-authenticate.vbs

Now you are ready to use noc-autenticate.vbs to test the NOC authentication feature.

Retrieve noc-authenticate.vbs

Retrieve noc-authenticate.vbs from \backend\vb and put it into a working folder.

You will also need cscript, which is a Microsoft tool that enables you to run VBScript from the command line. If cscript is not installed on your system, go to the Microsoft site and download it. It is part of Windows 2000 SP3.

Running the program

The program runs from a command line session with the syntax:

```
cscript noc-authenticate.vbs "CN3200_domain_name" "username"
"password" “user_IP” “client certificate”
```

Parameter	Description
CN3200_domain_name	Specify the domain name or IP address of the CN3200. For this example, use the domain name **www.noc-cn3000.com**.
usename	Specify the name of an existing user account.
password	Specify the password for the user account.
user_IP	Specify the the IP address of the client station you want to grant access to .
client_certificate	Specify the name of client certificate. For this example, the name of the client certificate is **Test-Only client certificate for demo.** This is the distinguished name that was specified when the certificate **noc-client.pfx** was created.

The program posts the information you specify to the following URL:

```
https://www.noc-cn3000.com:8090/goform/HtmlNocLoginRequest
```

The CN3200 will answer the post with the results of the RADIUS authentication. The program will print these results so you can view them. For a complete description of all possible return values, see “Authentication results” on page 348.

Examples

Example 1 - successful authentication

In this example, authentication is requested for a valid customer account that was defined during creation of the backend sample with Login name = user and Password = user.

cscript noc-authenticate.vbs "www.noc-cn3000.com" "user" "user" "192.168.1.10" "LOCAL_MACHINE\Test-Only client certificate for demo"

```
Microsoft (R) Windows Script Host Version 5.6
Copyright (C) Microsoft Corporation 1996-2001. All rights
reserved.

result:  10
status:  100
url:     https://206.162.167.226:8888/cebit-php/
welcome.php?site=eperie-cn3000&u
```

```
ser=user02&wantedurl=&nasipaddress=&nasid=L003-00069
session-url: http://192.168.1.1:8080/session.asp
```

A result of 10 with a status of 100 means that authentication was successful. For a description of this and other return codes, refer to “Authentication results” on page 348.

Since authentication was successful, the CN3200 returns the welcome page URL that the customer should be redirected to.

The session page URL is also returned, so that the customer’s web browser can be asked to open the session window.

Example 2 - successful authentication, already logged-in:

This example re-executes the previous command, resulting in an error because the customer is already logged in.

```
cscript noc-authenticate.vbs "www.noc-cn3000.com" "user" "user" "192.168.1.10"
"LOCAL_MACHINE\Test-Only client certificate for demo"
Microsoft (R) Windows Script Host Version 5.6
Copyright (C) Microsoft Corporation 1996-2001. All rights
reserved.

result:  10
status:  400
```

A result of 10 with a status of 400 means that the customer is already logged in.

Authentication results

The file noc.h contains the definitions used by the CN3200 when building the authentication results that are sent in reply to a customer authentication request.

noc.h contents

```
/******************************************************************************
 * noc.h - Definition of messages and constants used for NOC authentication
 *
 * Copyright (c) Colubris Networks Inc. 2002
 *
 * This code is provided "as is", without any warranty of any kind, either
 * expressed or implied, including but not limited to, any implied warranty
 * of merchantability or fitness for any purpose.
 * In no event will Colubris Networks Inc. or any party who distributed
 * the code be liable for damages or for any claim(s) by any other party,
 * including but not limited to, any lost profits, lost data or data rendered
 * inaccurate, losses sustained by third parties, or any other special,
 * incidental or consequential damages arising out of the use or inability to
 * use the program, even if the possibility of such damages has been advised
 * against.
 * The entire risk as to the quality, the performance, and the fitness of the
 * program for any particular purpose lies with the party using the code.
 *
 * This file should be usable on both win32 and Unix platforms.
 *
 ******************************************************************************/

#ifndef _NOC_H_
#define _NOC_H_

// Codes that will be returned by the authentication function
#define   ERR_NOC_AUTHENTICATION_BASE         0x1000
#define   ERR_NOC_AUTHENTICATION_SUCCESS     (ERR_NOC_AUTHENTICATION_BASE + 1)
#define   ERR_NOC_AUTHENTICATION_FAILURE     (ERR_NOC_AUTHENTICATION_BASE + 2)
#define   ERR_NOC_AUTHENTICATION_DISABLED    (ERR_NOC_AUTHENTICATION_BASE + 3)
#define   ERR_NOC_AUTHENTICATION_LOGGED_IN   (ERR_NOC_AUTHENTICATION_BASE + 4)

// Messages that will be sent to the client in reply to an authentication
// request.
#ifdef _WIN32

//        Using UNICODE constants
#define   NOC_HTML_BEGIN                        L"<html>"
#define   NOC_HTML_END                          L"</html>"
#define   NOC_INFO_STATUS                       L"status"
#define   NOC_INFO_WELCOME_URL                  L"welcome-url"
#define   NOC_INFO_LOGIN_ERR_URL                L"login-err-url"
#define   NOC_INFO_ERR_MESSAGE                  L"external-err-msg"
#define   NOC_INFO_INT_ERR_MESSAGE              L"local-err-msg"
#define   NOC_INFO_SESSION_URL                  L"session-url"

// Possible values for NOC_INFO_STATUS
#define   NOC_STATUS_SUCCESS                     L"success"
#define   NOC_STATUS_FAILURE                     L"failure"
#define   NOC_STATUS_DISABLED                    L"disabled"
#define   NOC_STATUS_LOGGED_IN                   L"already-logged-in"
```

```
 // Possible values for NOC_INFO_INT_ERR_MESSAGE
#define   NOC_CANNOT_GET_PEER_CERT               L"cannot-get-peer-cert"
#define   NOC_MISSING_USERNAME_OR_PASSWORD       L"missing-username-or-password"
#define   NOC_CERT_EXPIRED                       L"cert-expired"
#define   NOC_CERT_NOT_YET_VALID                 L"cert-not-yet-valid"
#define   NOC_CERT_NOT_IDENTICAL                 L"cert-not-identical"
#define  NOC_CERT_NOT_SIGNED_BY_AUTHORIZED_CA   L"cert-not-signed-by-authorized-ca"

#else

#define   NOC_HTML_BEGIN                         "<html>"
#define   NOC_HTML_END                           "</html>"
#define   NOC_INFO_STATUS                        "status"
#define   NOC_INFO_WELCOME_URL                   "welcome-url"
#define   NOC_INFO_LOGIN_ERR_URL                 "login-err-url"
#define   NOC_INFO_ERR_MESSAGE                   "external-err-msg"
#define   NOC_INFO_INT_ERR_MESSAGE               "local-err-msg"
#define   NOC_INFO_SESSION_URL                   "session-url"

// Possible values for NOC_INFO_STATUS
#define   NOC_STATUS_SUCCESS                     "success"
#define   NOC_STATUS_FAILURE                     "failure"
#define   NOC_STATUS_DISABLED                    "disabled"
#define   NOC_STATUS_LOGGED_IN                   "already-logged-in"

// Possible values for NOC_INFO_INT_ERR_MESSAGE
#define   NOC_CANNOT_GET_PEER_CERT               "cannot-get-peer-cert"
#define   NOC_MISSING_USERNAME_OR_PASSWORD       "missing-username-or-password"
#define   NOC_CERT_EXPIRED                       "cert-expired"
#define   NOC_CERT_NOT_YET_VALID                 "cert-not-yet-valid"
#define   NOC_CERT_NOT_IDENTICAL                 "cert-not-identical"
#define   NOC_CERT_NOT_SIGNED_BY_AUTHORIZED_CA   "cert-not-signed-by-authorized-ca"
#endif
#endif
```

Returned values

The following examples show the information returned for various authentication conditions.

NOC authentication mode is not enabled:

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_DISABLED
</HTML>
```

The CN3200 did not receive the login application’s SSL certificate

The login application did not send its certificate. Therefore, the request was rejected.

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_CANNOT_GET_PEER_CERT
</HTML>
```

Certificate mismatch

The login application sent an SSL certificate that does not match the one defined by ssl-noc-certificate in the RADIUS profile for the CN3200.

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_CANNOT_GET_PEER_CERT
</HTML>
```

Certificate not valid yet

The login application sent an SSL certificate that matches the one defined by ssl-noc-certificate in the RADIUS profile for the CN3200. However, the certificate that was sent is not yet valid.

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_CERT_NOT_YET_VALID
</HTML>
```

Certificate not valid anymore

The login application sent an SSL certificate that matches the one defined by ssl-noc-certificate in the RADIUS profile for the CN3200. However, the certificate that was sent is not valid anymore.

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_CERT_EXPIRED
</HTML>
```

Certificate not signed by proper CA

The login application sent a valid SSL certificate that matches the one defined by ssl-noc-certificate in the RADIUS profile for the CN3200. However, it the certificate is not signed by the CA defined by noc-ca-certificate in the RADIUS profile for the CN3200

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_CERT_NOT_SIGNED_BY_AUTHORIZED_CA
</HTML>
```

Missing username and/or password

The customer’s username or password was not supplied.

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=NOC_MISSING_USERNAME_OR_PASSWORD
</HTML>
```

The specified IP address is already logged in

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_LOGGED_IN
</HTML>
```

Authentication was successful

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_SUCCESS
NOC_INFO_WELCOME_URL=<welcome url>
NOC_INFO_SESSION_URL=<session url>
</HTML>
```

Authentication failed

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_ERR_MESSAGE=<error message>
NOC_INFO_LOGIN_ERR_URL =<login error url>
</HTML>
```

Logout succeeded

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_SUCCESS
</HTML>
```

Logout failed

```
<HTML>
NOC_INFO_STATUS=NOC_STATUS_FAILURE
NOC_INFO_INT_ERR_MESSAGE=<error message>
</HTML>
```

Examples

The following examples show the actual HTML code returned file for various authentication conditions.

Customer was successfully authenticated by the RADIUS server

```
<HTML>
status=success
welcome-url=https://206.162.167.226:8888/cebit-php/
welcome.php?site=www.noc-
CN3200.com&user=user00&wantedurl=&nasipaddress=&nasid=L003-00069
session-url=http://192.168.1.1:8080/session.asp
</HTML>
```

Customer's IP address is already in use by an active session

```
<HTML>
status=already-logged-in
</HTML>
```

Customer authentication was refused by the RADIUS server.

This could be due to an unknown username, or invalid username or password.

```
<HTML>
status=failure
external-err-msg=Your login was refused.
login-err-url=https://206.162.167.226:8888/cebit-php/login-
error.php?site=eperie-cn3000&user=user12&nasipaddress=
</HTML>
```

Customer could not be authenticated

The CN3200 could not contact a RADIUS server.

```
<HTML>
status=failure
external-err-msg=You cannot be logged in at this time. Please try
again later.
login-err-url=https://206.162.167.226:8888/cebit-php/login-
error.php?site=eperie
-cn3000&user=user12&nasipaddress=
</HTML>
```

Chapter 21

The configuration file

This chapter provides an overview of the configuration file and explains how to edit it.

Manually editing the config file

The configuration file contains the settings for all customizable parameters on the CN3200. Almost all of these parameters can be set using the web-based management tool. However, certain infrequently-used parameters can only be set by manually editing the configuration file.

Retrieving/ restoring the configuration file

To edit the configuration file, you must first retrieve it from the CN3200. Once edited, it then needs to be restored. There are several ways to do this:

- The easiest way to accomplish both tasks is via the management tool. Use the **Config file management** page on the **Maintenance** menu to download/upload the configuration file.
- HTTPS: The configuration file can be downloaded and uploaded via HTTPS. Using a tool like cURL makes this easy. See “Configuration management” on page 53 for details.
- Many configuration file parameters are also accessible via SNMP. For details see the comments inside the Colubris-Maintenance-MIB which is available on the the Colubris Networks web site.

Important: *The local username and password for the administrator is not saved when you use the Backup Configuration option. If you upload a configuration file, the old username and password are therefore not updated.*

Important: *If you upload a configuration file with an invalid structure, it is possible to put the CN3200 into an unstable state. To return to normal operation, do a factory reset.*

Configuration file structure

The configuration file is an ASCII file and can be edited in a standard text editor. Key components in the file are:

- **Block:** A block contains sections, sub-sections, and parameters. Blocks start with:

  ```
  %begin block_name
  ```

  and end with

  ```
  %end block_name
  ```

- **Section:** A section contains sub-sections and parameters. Sections start with:

  ```
  [SECTION_NAME]
  ```

  and end with another block or section name. Section names are not case sensitive.

- **Sub-section:** A sub-section contains parameters. Sub-sections start with:

  ```
  <SUB-SECTION_NAME>
  ```

  and end with another block, section, or sub-section name. Sub-section names are not case sensitive.

- **Parameter:** A parameter takes the form: *parameter* = *value*

  Each parameter and value pair must appear on its own line. Parameter names are not case sensitive. Parameter values **are** case-sensitive.

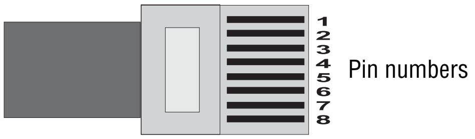
- **Comments:** Comments begin with the pound sign (#) and continue until the end of the line.
- Dash (-) and underscore (_) characters can be used in section names, sub-section names, and parameter names, and are strictly equivalent.
- Blank lines are ignored and may be added in to make the file easier to read.
- Strings containing spaces must be contained in double-quotes.

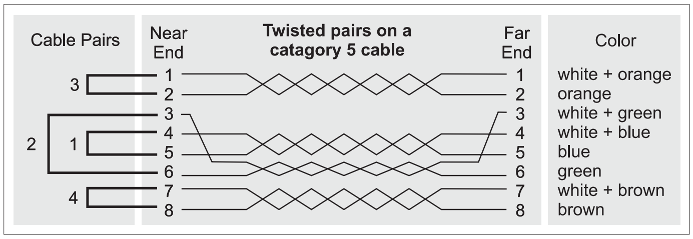
Chapter 22
Building a cross-over cable

This chapter explains how to build a cross-over cable.

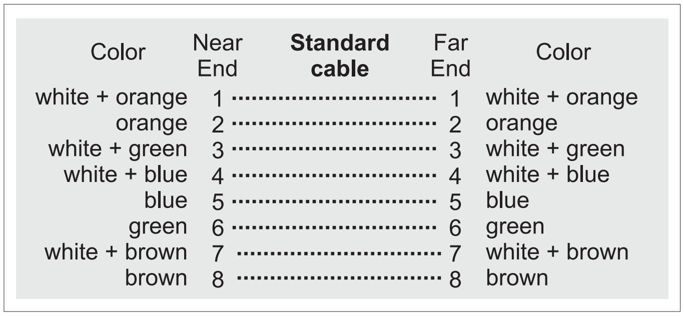
Wiring details

Use the information in the following diagrams to build a cross-over cable.



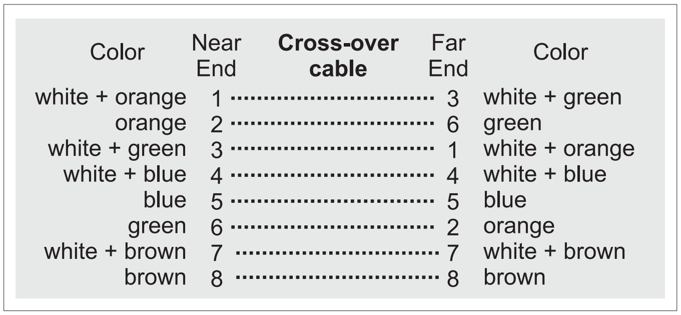


Construction details for a standard category 5 cable.



Color	Near End	**Standard cable**	Far End	Color
white + orange	1		1	white + orange
orange	2		2	orange
white + green	3		3	white + green
white + blue	4		4	white + blue
blue	5		5	blue
green	6		6	green
white + brown	7		7	white + brown
brown	8		8	brown

Wiring diagram for a standard cable.



Color	Near End	**Cross-over cable**	Far End	Color
white + orange	1		3	white + green
orange	2		6	green
white + green	3		1	white + orange
white + blue	4		4	white + blue
blue	5		5	blue
green	6		2	orange
white + brown	7		7	white + brown
brown	8		8	brown

Wiring diagram for a cross-over cable.

Note: *Some cable manufacturers may use different color codes for their wiring.*

Chapter 23
Troubleshooting

This chapter provides troubleshooting tips for a variety of common problems.

CN3200 issues

1 CN3200 cannot connect to the Internet (ISP)

Symptoms

- The current Internet address field on the home page is blank.
- CN3200 cannot contact RADIUS server.

Causes on the CN3200

- Wrong client (PPPoE, DHCP) selected to obtain IP address.
- Wrong username or password specified for PPPoE.
- Cable or xDSL modem was not restarted after connecting it to the CN3200.
- Cable or xDSL modem is not working.
- ISP is not working.
- Ethernet cable plugged into the wrong port on CN3200 or modem.
- Wrong Ethernet cable was used to connect CN3200 to modem.
- DNS settings are not correct or the DNS server is not reachable.

2 CN3200 fails to connect to the RADIUS server

Before you troubleshoot this problem, make sure that condition #1 does not exist.

Symptoms

- Red light on the **Security > Authentication** page does not change to green.
- Home page shows message “Authentication system is down”.
- Custom public access interface pages do not appear.
- MAC authenticated devices cannot reach Internet.
- Locally authenticated users cannot login.

Causes on the RADIUS server

Check the RADIUS server log file for the specific cause. Common causes are:

- No user profile is defined for the CN3200 or the profile is misconfigured.

Causes on the CN3200

Check the CN3200 log file for the specific cause. Common causes are:

- Wrong shared secret set on the **Security > RADIUS** page.
- Wrong username and password set on the **Security > Authentication** page.
- Old RADIUS servers may use a different UDP port or authentication scheme. Check the settings on the **Security > RADIUS** page.
- There may be routing issues preventing the CN3200 from reaching the RADIUS server.
- If you are using a VPN, make sure that it is properly configured on both sides.
- Custom firewall rules were added that block RADIUS packets (by default: 1812 and 1813 for accounting).

3 Lost administrator password

Reset the CN3200 to factory defaults. This sets username and password to **admin**.

Client station issues

4 Wireless client station cannot establish a wireless link with the CN3200

Symptoms

- The CN3200 is not visible in the wireless client's status display.
- The client station is unable to access to access the login page or public resources on the wireless network.

Causes on the CN3200

- The wireless card on the back of the CN3200 is loose or missing.
- A brown out occurred. Restart theCN3200.

Causes on the client station

- Wireless adapter is not properly installed (wrong drivers, conflicts with other cards in the system).
- Wireless adapter software is not active.
- Incorrect network name (ESSID). Make sure it matches the setting on the CN3200.
- Incorrect WEP keys. Make sure that the keys match those set on the CN3200.
- Customer is out of operating range of the access point.
- Client station is using shared network authentication and WEP keys do not match those configured on the CN3200.

Other causes

- Signal quality to one or more stations is poor or being subject to interference (interference caused by 2.4 GHz cordless phone, or microwave oven for example). This can cause excessive retransmissions of data and collisions.

5 Wireless client station cannot get an IP address

Before you troubleshoot this problem, make sure that condition #4 does not exist.

Symptoms

The client station is unable to access the login page or public resources on the wireless network.

Causes on the CN3200

- DHCP services are not properly configured or reachable.
- WEP configuration does not match on CN3200 and client station.

Causes on the client station

- 802.1x support (if being used), is improperly configured.

6 Authenticated customers cannot use the public access network

Symptoms

- Customer’s web browser times out when trying to open an external web page. Although the session page will appear in most cases.

Causes on the CN3200

- Custom firewall rules are in place to block outgoing traffic.
- The target network resource is blocked by an access list definition.

Causes on the client station

DNS server is down.

7 Authenticated customer using 802.1x cannot use the public access network

Before you troubleshoot this problem, make sure that condition #4 does not exist.

Symptoms

The client station was authenticated via 802.1x, and may even display an IP address. However, it is unable to use the features of the public access network.

Causes on the CN3200/client station

- WEP configuration does not match settings on the CN3200.

8 Login page does not appear to unauthenticated wireless customers

Before you troubleshoot this problem, make sure that conditions #2 and #5 do not exist.

Symptoms

- Customer’s web browser times out when trying to open an external web page.

Causes on the CN3200

- DNS settings are not correct.
- If a remote login page is being used, then access to this page has not been defined (using the appropriate access list) for authenticated customers.

Causes on the client station

- Customer’s browser is not installed or configured properly (set to use dial-up connection instead of LAN).
- Client station has two network adapters and they are not properly configured.

9 Login page does not appear to unauthenticated wired customers

Before you troubleshoot this problem, make sure that condition #2 does not exist.

Symptoms

- Customer’s web browser times out when trying to open an external web page.

Causes on the CN3200

- If a remote login page is being used, then access to this page has not been defined (using the appropriate access list) for authenticated customers.

- The CN3200 is not assigned an address on the same subnet as the wired LAN.
- The connection to the wired LAN was made on the wrong port (Internet port was used instead of the LAN port), or with the wrong type of cable.

Causes on the client station

- Customer’s browser is not installed or configured properly (set to use dial-up connection instead of LAN).
- Client station has two network adapters and they are not properly configured.

10 Login information must be specified manually when using 802.1x

Symptoms

Customers using 802.1x are not automatically logged in. Instead, they must supply login information manually.

Causes on the CN3200

Support for 802.1x is not enabled on the **Security** > **Authentication** page.

11 Customer login is refused

Before you troubleshoot this problem, make sure that condition #2 does not exist.

Symptoms

Customers get the login error page after submitting their login information.

Causes on the CN3200

The settings for the RADIUS profile being used for customer authentication (**Security** > **RADIUS** page) are improperly configured.

Causes on the client station

- Wrong username and/or password was supplied.
- 802.1x client settings configured improperly.

On the RADIUS server

- Customer is not properly configured.
- RADIUS server is not reachable.

12 Customer is automatically logged out.

Symptoms

Customers session is terminated by the CN3200.

Causes on the RADIUS server

- Customer exceeded an upload, or download quota, or session time.
- Customer was out of range of an access point for too long. (Controlled by the **Client station query** setting on the **Security** > **Authentication** > **Advanced Settings** page.)
- Customer session was idle for too long.
- Customer is using the same IP address as another customer. Both customers are automatically logged out.
- CN3200 was restarted.

13 Low wireless throughput

Symptoms

Client computers are experiencing delays when transmitting. One or more of following statistics on the wireless status page are excessively high: Tx multiple retry frames, Tx single retry frames, Tx deferred transmissions

Causes

- Too many client stations are using the network, or one or more clients is monopolizing the bandwidth with excessively large transfers.
- Signal quality to one or more stations is poor or being subject to interference (which can be caused by 2.4 GHz cordless phone or a microwave oven). This can cause excessive retransmissions of data and collisions. Both create overhead that will slow down overall throughput.
- One or more access points are sharing the same operating frequency. This can cause excessive retransmissions to occur, especially if the units are physically located close together and are on the same channel.

14 Specific Internet application does not work

Both the firewall and NAT can interfere with the operation of certain applications. See “Firewall” on page 83 and “Network address translation” on page 89 for more information.

Management issues

15 Web browser cannot connect to management tool

Before you troubleshoot this problem, make sure that condition #1 does not exist.

Symptoms

Management tool home page does not open.

Causes on the CN3200

- Local access
  - Web port was changed from default setting (**Management > Management tool** page).
  - Management tool is set to block access on the LAN port.
- Remote access
  - Firewall is blocking HTTPS access.
  - Management tool is set to block access on the Internet port or VPN.
  - Another client station is currently logged in.
  - A web server is running on the internal network using a static mapping for HTTPS port 443.

Causes on a local client station

- Wrong IP address was specified. Default is 192.168.1.1 on the wireless/LAN port, but this may have been changed.
- HTTP was specified instead of HTTPS.
- Wrong web port was specified. This will only occur if the web port was changed from its default setting on the Management Tool configuration page.

Causes on a remote client station (via Internet)

- Wrong IP address was specified. Do not use 192.168.1.1., instead use the address visible on the Internet port, (visible on the home page). This address may change if you restart the CN3200 or your modem.
- Wrong web port was specified. This will only occur if the web port was changed from its default setting on the Management Tool configuration page.
- HTTP was specified instead of HTTPS.

16 Firmware or configuration upload failed

Symptoms

Log file indicates that the upload failed via web or RADIUS profile.

Causes on the CN3200

- Firmware or configuration file is invalid.
- Wrong address was specified when using automatically firmware upload or RADIUS server to upload the configuration file.

Other causes

- Remote server hosting the firmware is unreachable or down.

Chapter 24

Regulatory, wireless interoperability, and health information

Regulatory information

The CN3200 complies with the following radio frequency and safety standards.

Canada - Industry Canada (IC)

This device complies with RSS 210 of Industry Canada.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 et CNR 210 d’Industrie Canada.

Europe - EU Declaration of Conformity

This device is for indoor use only.

Important: *Users must select the proper country of operation in the management tool to ensure wireless operational settings conform to local regulations.*

Important: *If more than one unit is deployed users must ensure that the operating frequencies are spread amoung different channels (according to channel availability).*

USA - Federal Communications Commission (FCC)

The CN3200 complies with Part 15 of FCC Rules. Operation of the CN3200 in a system is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference that may cause undesired operation.

Caution: Exposure to Radio Frequency Radiation

The radiated output power of the CN3200 is far below the FCC radio frequency exposure limits. Nevertheless, the CN3200 should be used in such a manner as to minimize the potential for human contact during normal operation. When using this device in combination with Colubris Networks antenna products, a certain separation distance between the antenna and nearby persons has to be kept to ensure FR exposure compliance.

Refer to the Regulatory Statements as identified in the documentation that comes with those products for additional information.

When an external antenna is connected to the CN3200 it shall be placed in such a manner as to minimize the potential for human contact during normal operation. To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

When no external antenna is connected, the RF output power of the CN3200 is far below the FCC radio frequency exposure limits. Nevertheless, it is advised to use the CN3200 in such a manner that human contact during normal operation is minimized.

Interference Statement

The CN3200 has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

The CN3200 generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If the CN3200 causes harmful interference to radio or television reception, which can be determined by turning the CN3200 on and off, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the CN3200 and the receiver.
- Connect the CN3200 to an outlet on a circuit different from that which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

Colubris Networks Inc. is not responsible for any radio or television interference caused by unauthorized modification of the CN3200, or the substitution or attachment of connecting cables and equipment other than that specified by Colubris Networks Inc.

The correction of interference caused by such unauthorized modification, substitution or attachment is the responsibility of the user.

Health Information

The CN3200, like other radio devices, emits radio frequency electromagnetic energy. The level of energy emitted by the CN3200 is much less than the electromagnetic energy emitted by other wireless devices, such as mobile phones.

Because the CN3200 operates within the guidelines found in radio frequency safety standards and recommendations, Colubris Networks believes that the CN3200 is safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.

In some situations or environments, the use of the CN3200 may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may, for example, include:

- Using the CN3200 on board airplanes or,
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies to the use of wireless devices in a specific organization or environment (e.g. airports), you are encouraged to ask for authorization to use the CN3200 prior to turning it on.

Important

Ports

LAN port

Do not connect this port directly to a metropolitan area network (MAN) or wide area network (WAN).

Internet port

Do not connect this port directly to a metropolitan area network (MAN) or wide area network (WAN).

Serial port

For future use. Do not connect this port to telecommunications equipment or a phone line.

Installation

Important: *Installation must be performed by a professional installer familiar with local regulations governing wireless devices.*

CAUTION: Changes or modifications not expressly approved by Colubris Networks for compliance could void the user's authority to operate the equipment.

The installation and operating configurations of this transmitter, including the antenna gain and cable loss, must satisfy MPE Categorical Exclusion Limits of 2.1091. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end users must be provided with operating instructions and antenna installation conditions for satisfying RF exposure compliance requirements.