



## **Certified IPv6 Engineer (MTCIPv6E)**

Training outline

<b>Duration:</b>	2 days
<b>Outcomes:</b>	By the end of this training session, the student will be familiar with IPv6 protocol and be capable to implement IPv6 network.
<b>Target audience:</b>	Network engineers and technicians wanting to deploy and support IPv6 based: <ul style="list-style-type: none"><li>• Corporate networks</li><li>• Client CPEs (WISPs and ISPs)</li></ul>
<b>Course prerequisites:</b>	MTCNA certificate

Title	Objective
<p><b>Module 1</b> Introduction to IPv6</p>	<ul style="list-style-type: none"> <li>• IPv6 address <ul style="list-style-type: none"> <li>• Differences between IPv4 and IPv6</li> </ul> </li> <li>• Address distribution</li> <li>• Address notation <ul style="list-style-type: none"> <li>• SLAAC IPv6 address creation (EUI-64)</li> </ul> </li> <li>• Subnetting</li> <li>• Address types <ul style="list-style-type: none"> <li>• Link-local</li> <li>• Global</li> <li>• Multicast</li> <li>• Anycast</li> <li>• Unique local</li> <li>• Special addresses</li> </ul> </li> <li>• Reserved IPv6 addresses</li> <li>• <b>Module 1 laboratory</b></li> </ul>
<p><b>Module 2</b> IPv6 Protocol</p>	<ul style="list-style-type: none"> <li>• Address configuration <ul style="list-style-type: none"> <li>• Auto-configuration</li> <li>• Stateless – SLAAC, DHCPv6</li> <li>• Stateful – DHCPv6</li> </ul> </li> <li>• Neighbor discovery protocol</li> <li>• IPv6 routing basics <ul style="list-style-type: none"> <li>• IPv6 prefix</li> </ul> </li> <li>• <b>Module 2 laboratory</b></li> </ul>
<p><b>Module 3</b> IPv6 Packet</p>	<ul style="list-style-type: none"> <li>• IPv6 header <ul style="list-style-type: none"> <li>• Header field description</li> <li>• Next header (daisy chaining)</li> <li>• Fragmentation</li> </ul> </li> <li>• Path MTU discovery</li> <li>• <b>Module 3 laboratory</b></li> </ul>

<p><b>Module 4</b> IPv6 Security</p>	<ul style="list-style-type: none"><li>• ICMPv6</li><li>• Neighbor discovery protocol<ul style="list-style-type: none"><li>• Router solicitation</li><li>• Router advertisement</li><li>• Neighbor solicitation<ul style="list-style-type: none"><li>• Duplicate address detection</li><li>• Neighbor unreachability detection</li></ul></li><li>• Neighbor advertisement<ul style="list-style-type: none"><li>• 'Managed address configuration' flag</li><li>• 'Other configuration' flag</li></ul></li><li>• Redirect</li></ul></li><li>• MLD (Multicast Listener Discovery)</li><li>• Temporary addresses</li><li>• Firewall</li><li>• IPsec<ul style="list-style-type: none"><li>• Header only encryption (AH)</li><li>• Data only encryption (ESP)</li><li>• Header and data encryption (AH+ESP)</li></ul></li><li>• <b>Module 4 laboratory</b></li></ul>
<p><b>Module 5</b> Transition Mechanisms</p>	<ul style="list-style-type: none"><li>• Dual stack (RIPE recommended)</li><li>• 6to4</li><li>• 6RD</li><li>• Teredo</li><li>• DS-lite (Dual stack lite)</li><li>• <b>Module 5 laboratory</b></li></ul>

<p><b>Module 6</b> Interoperability</p>	<ul style="list-style-type: none"><li>• IPv6 pool</li><li>• DHCP<ul style="list-style-type: none"><li>• DHCP PD server</li><li>• DHCP PD client</li><li>• DHCPv6 client</li></ul></li><li>• IPv6 tunnels<ul style="list-style-type: none"><li>• IPIPv6</li><li>• EoIPv6</li><li>• GRE6</li></ul></li><li>• IP version agnostic<ul style="list-style-type: none"><li>• DNS</li><li>• Reverse DNS</li><li>• NTP</li><li>• PPP IPv6 support</li></ul></li><li>• Routing<ul style="list-style-type: none"><li>• Using global addresses as in IPv4</li><li>• Using link-local addresses as in IPv6</li></ul></li><li>• RouterOS features not yet available for IPv6<ul style="list-style-type: none"><li>• NAT</li><li>• HotSpot</li><li>• RADIUS integration</li><li>• Policy routing</li><li>• DHCPv6 server</li></ul></li><li>• Tools<ul style="list-style-type: none"><li>• Ping</li><li>• Traceroute</li><li>• Torch</li><li>• Traffic generator</li><li>• Email</li><li>• Netwatch</li><li>• Traffic flow</li></ul></li><li>• <b>Module 6 laboratory</b></li></ul>
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