

# MTCSWE

Table 1. MikroTik Certified Switching Engineer

Раздел	Содержание
Introduction	<ul style="list-style-type: none"><li>• Layer2 forwarding concepts<ul style="list-style-type: none"><li>◦ Unicast, multicast and broadcast traffic</li><li>◦ MAC learning in bridges and switches</li><li>◦ Interface settings</li></ul></li><li>• RouterOS bridge overview</li><li>• RouterBOARD switch chip overview<ul style="list-style-type: none"><li>◦ RouterBOARDS with basic switch chips</li></ul></li><li>• Cloud Router Switch (CRS) series devices with advanced switch chips</li><li>• SwitchOS (SwOS) brief overview</li></ul>
MTU	<ul style="list-style-type: none"><li>• MTU</li><li>• L2MTU</li><li>• Jumbo Frames</li><li>• Potential MTU issues</li></ul>
VLAN	<ul style="list-style-type: none"><li>• 802.1Q and 802.1ad VLAN overview and tagging concepts</li><li>• RouterOS VLAN interfaces<ul style="list-style-type: none"><li>◦ Port based VLAN (VLAN bridging)</li><li>◦ Inter-VLAN routing ('router on a stick')</li></ul></li><li>• VLANs in basic switch chips<ul style="list-style-type: none"><li>◦ Port based VLAN</li></ul></li><li>• VLANs in Bridge interfaces P** ort based VLAN<ul style="list-style-type: none"><li>◦ MAC based VLAN</li><li>◦ Protocol based VLAN</li></ul></li><li>• QinQ (802.1ad)<ul style="list-style-type: none"><li>◦ QinQ implementation with bridges</li><li>◦ QinQ implementation on Cloud Router Switches (CRS)</li></ul></li></ul>
Spanning Tree Protocol	<ul style="list-style-type: none"><li>• Spanning tree protocol (STP) concepts<ul style="list-style-type: none"><li>◦ STP bridge priority</li><li>◦ STP port path cost</li><li>◦ STP and RSTP comparison</li></ul></li><li>• Multiple Spanning Tree (MSTP) concepts<ul style="list-style-type: none"><li>◦ MSTP definition</li><li>◦ MSTP regions</li><li>◦ CST CIST</li></ul></li><li>• Bridge protocol data unit (BPDU)</li><li>• Spanning Tree Security</li></ul>

Раздел	Содержание
Link Aggregation	<ul style="list-style-type: none"> <li>RouterOS bonding <ul style="list-style-type: none"> <li>Bonding modes</li> <li>Compatibility with other static link aggregation</li> </ul> </li> </ul>
Port Isolation	<ul style="list-style-type: none"> <li>RouterOS bridge horizon</li> <li>CRS port isolation</li> </ul>
QoS	<ul style="list-style-type: none"> <li>Layer2 QoS (802.1p) <ul style="list-style-type: none"> <li>RouterOS bridge filter priority</li> <li>CRS priority configuration</li> </ul> </li> <li>Traffic shaping <ul style="list-style-type: none"> <li>Bandwidth limiting в bridge with queues</li> <li>Bandwidth limiting в CRS switch chip</li> </ul> </li> </ul>
Layer2 Security	<ul style="list-style-type: none"> <li>IGMP Snooping</li> <li>DHCP Snooping</li> <li>Loop Protect</li> <li>Traffic Storm Control</li> <li>Port Security</li> <li>Layer2 firewall <ul style="list-style-type: none"> <li>RouterOS bridge filter features</li> <li>CRS access control list</li> </ul> </li> <li>BPDU Guard</li> <li>ARP Modes</li> <li>802.1X</li> <li>Switch Security</li> </ul>
PoE	<ul style="list-style-type: none"> <li>RouterOS PoE Modes и compatibility</li> <li>RouterOS PoE Priority Settings</li> <li>RouterOS PoE Monitoring</li> </ul>
Tools	<ul style="list-style-type: none"> <li>Layer2 diagnostic tools</li> <li>Port Mirroring</li> </ul>
SwOS	<ul style="list-style-type: none"> <li>Introduction to SwOS</li> <li>RouterBOARD dual-boot compatibility</li> <li>Installing SwOS</li> <li>Managing SwOS</li> <li>Configuration of Layer2 Features with SwOS <ul style="list-style-type: none"> <li>VLANS</li> <li>®STP</li> <li>Port Trunking</li> <li>QoS</li> <li>Layer2 Security</li> </ul> </li> </ul>