

MTCSWE

Table 1. MikroTik Certified Switching Engineer

Раздел	Содержание
Introduction	<ul style="list-style-type: none">• Layer2 forwarding concepts<ul style="list-style-type: none">◦ Unicast, multicast and broadcast traffic◦ MAC learning in bridges and switches◦ Interface settings• RouterOS bridge overview• RouterBOARD switch chip overview<ul style="list-style-type: none">◦ RouterBOARDS with basic switch chips• Cloud Router Switch (CRS) series devices with advanced switch chips• SwitchOS (SwOS) brief overview
MTU	<ul style="list-style-type: none">• MTU• L2MTU• Jumbo Frames• Potential MTU issues
VLAN	<ul style="list-style-type: none">• 802.1Q and 802.1ad VLAN overview and tagging concepts• RouterOS VLAN interfaces<ul style="list-style-type: none">◦ Port based VLAN (VLAN bridging)◦ Inter-VLAN routing ('router on a stick')• VLANs in basic switch chips<ul style="list-style-type: none">◦ Port based VLAN• VLANs in Bridge interfaces P** ort based VLAN<ul style="list-style-type: none">◦ MAC based VLAN◦ Protocol based VLAN• QinQ (802.1ad)<ul style="list-style-type: none">◦ QinQ implementation with bridges◦ QinQ implementation on Cloud Router Switches (CRS)

Раздел	Содержание
Spanning Tree Protocol	<ul style="list-style-type: none"> • Spanning tree protocol (STP) concepts <ul style="list-style-type: none"> ◦ STP bridge priority ◦ STP port path cost ◦ STP and RSTP comparison • Multiple Spanning Tree (MSTP) concepts <ul style="list-style-type: none"> ◦ MSTP definition ◦ MSTP regions ◦ CST CIST • Bridge protocol data unit (BPDU) • Spanning Tree Security
Link Aggregation	<ul style="list-style-type: none"> • RouterOS bonding <ul style="list-style-type: none"> ◦ Bonding modes ◦ Compatibility with other static link aggregation
Port Isolation	<ul style="list-style-type: none"> • RouterOS bridge horizon • CRS port isolation
QoS	<ul style="list-style-type: none"> • Layer2 QoS (802.1p) <ul style="list-style-type: none"> ◦ RouterOS bridge filter priority ◦ CRS priority configuration • Traffic shaping <ul style="list-style-type: none"> ◦ Bandwidth limiting в bridge with queues ◦ Bandwidth limiting в CRS switch chip
Layer2 Security	<ul style="list-style-type: none"> • IGMP Snooping • DHCP Snooping • Loop Protect • Traffic Storm Control • Port Security • Layer2 firewall <ul style="list-style-type: none"> ◦ RouterOS bridge filter features ◦ CRS access control list • BPDU Guard • ARP Modes • 802.1X • Switch Security
PoE	<ul style="list-style-type: none"> • RouterOS PoE Modes и compatibility • RouterOS PoE Priority Settings • RouterOS PoE Monitoring

Раздел	Содержание
Tools	<ul style="list-style-type: none"> • Layer2 diagnostic tools • Port Mirroring
SwOS	<ul style="list-style-type: none"> • Introduction to SwOS • RouterBOARD dual-boot compatibility • Installing SwOS • Managing SwOS • Configuration of Layer2 Features with SwOS <ul style="list-style-type: none"> ◦ VLANs ◦ RSTP ◦ Port Trunking ◦ QoS ◦ Layer2 Security