

Fortigate debug and diagnose commands complete cheat sheet

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NOTE

To enable debug set by any of the commands below, you need to run **diagnose debug enable**. This is assumed and not reminded any further. Use **dia debug info**

to know what debug is enabled, and at what level.

NOTE

To disable and stop immediately any debug, run **dia deb res** which is short for **diagnose debug reset**.

NOTE

All debug will run for 30 minutes by default, to increase use **diagnose debug duration <minutes>**, setting to 0 means unlimited by time. Reboot will reset this setting.

Security rulebase debug (diagnose debug flow)

Table 1. Security rulebase diagnostics with **diagnose debug flow**

Command	Description
diagnose firewall iprobe lookup <src IP> <src port> <dst IP> <dst port> <IANA protocol number> <src interface>	Policy lookup for any combination of IPs and ports - use to see what policy (if any) matches traffic between specific IP addresses and ports. E.g. dia firewall iprobe lookup 10.10.10.1 34567 8.8.8.8 443 6 LAN1
diagnose debug flow filter	Show the active filter for the flow debug
diagnose debug filter clear	Remove any filtering of the debug output set

Command	Description
diagnose debug flow filter <filtering param> / dia debug flow filter6 <param>	<p>Set filter for security rulebase processing packets output. You can set multiple filters - act as AND, by issuing this command multiple times. Parameters:</p> <p>vd - id number of the vdom. When entering the vdom with edit vdom, this number is shown first.</p> <p>vd-name - limit debug to specific VDOM by its name. Fortigate translates the name to VDOM ID (vd).</p> <p>proto - Protocol number.</p> <p>addr - IP address of the packet(s), be it a destination or/and a source.</p> <p>saddr - IP source address of the packet(s).</p> <p>daddr - IP destination address of the packet(s).</p> <p>port - Source or/and destination port in the packet(s).</p> <p>sport - Source port of the packet(s).</p> <p>dport - Destination port of the packet(s).</p> <p>negate <parameter> - negate the match, i.e. match if a packet does NOT contain <parameter>. Where parameter is one of the above: vd, addr, saddr, port, sport, dport</p>
diagnose debug filter6 <parameter>	Same as diagnose debug filter but for IPv6 packets. The rest of matching and conditions remain of the same syntax.
diagnose debug flow show function-name enable	Show function names responsible for each step in processing.
diagnose debug flow trace start [number]	Actually start the debug with optional number to limit number of packets traced.
diagnose debug flow trace start6 [number]	Start the debug trace for IPv6 traffic, with optional number to limit number of packets traced.

Packet Sniffer (diagnose sniffer packet)

Command	Description
dia sni pa <i>if-name</i>/any 'tcpdump syntax filter' <i>verbosity count time-format</i>	<p>Network level packet sniffer like tcpdump/tshark/wireshark, presenting captured packets on CLI. It gives definite answers whether a packet reached the Fortigate, whether it was dropped by firewall rules, what was incoming/outgoing interface, and contents of the packet if needed.</p> <p>verbosity - level of detail to present, can be one of:</p> <p>1 - packets' header, includes IP addresses, ports, and flags if set.</p> <p>2 - packets' header and data for IP packet, i.e. same as above plus contents of the packet.</p> <p>3 - same as 2 above plus Ethernet header.</p> <p>4 - packets' header (no contents) plus incoming/outgoing interface name for each packet. This gives the indication whether the packet passed the Fortigate or was dropped by it.</p> <p>5 - same data as 4 plus contents of IP packets.</p> <p>6 - packets' header starting from Ethernet plus contents and incoming/outgoing interface names.</p> <p>count - number of packets to capture, integer. If not set, will be capturing until the SSH/console timeout or until stopped with CTRL + C.</p> <p>time-format:</p> <ul style="list-style-type: none">• a - absolute UTC time• l - local time• default - relative to the start of sniffing in seconds.milliseconds.
IPv6	For IPv6 traffic, the command is the same, but use the relevant filter clauses instead, e.g. host 2001:db8::1 or net 2001:db8::/64 or icmp6 .

Command	Description
set auto-asic-offload disable	You may need to temporarily disable NPU hardware acceleration offloading, to see accelerated packets. You do so inside a specific firewall policy. This will cause all packets passing on this policy rule to be processed by CPU and thus make packets visible to the sniffer. This may increase the CPU load. E.g. <code>config firewall policy, edit 1, set auto-asic-offload disable</code> . Do not forget to turn it on again: <code>set auto-asic-offload enable</code> .

General Health, CPU, and Memory

Table 2. General Health, CPU, and Memory loads

Command	Description
get sys stat	Get statistics about the Fortigate device: FortiOS used, license status, Operation mode, VDOMs configured, last update dates for AntiVirus, IPS, Application Control databases.
get sys performance stat	Show real-time operational statistics: CPU load per CPU, memory usage, average network/session, uptime.
diagnose sys top [refresh] [num-of-processes] [iterations]	Print list of running processes updated every <i>refresh</i> seconds (default 5), for <i>iterations</i> times, sorted in descending order by the CPU load. This <code>top</code> command does not display all processes by default, to show them all, set <i>num-of-processes</i> to high number, for example 100. Press "m" to sort the processes by memory consumption. The displayed table is in this order: <code>Process id, process state: @unning, (S)leep, (Z)ombie, (D)isk Sleep, < Means higher priority, CPU used, Memory used</code> .
dia sys kill signal-id process-id	Forcefully kill the process with the id of <i>process-id</i> , sending it the given <i>signal-id</i> (Linux signals, e.g. 9, 11).
diagnose debug crashlog read	Display crash log. Records all daemons crashes and restarts. Some daemons are more critical than others.
diagnose debug crashlog clear	Clear the crash log.

Command	Description
dia sys top-mem [num-processes] [detail]	Show top (default 5) processes by memory usage, optionally set number of processes to show with <i>num-processes</i> , and use detail to get verbose output (a lot).
get hardware memory	Show memory statistics: free, cached, swap, shared
dia hardware sysinfo conserve	Info whether the conserve mode on or off, total memory available, conserve mode thresholds red and green
execute sensor list	List current readings of all sensors present on this model of the Fortigate. Larger models (1500 and up) show CPUs voltage, fan speeds, temperature, power supply voltage and more.
dia sys flash list	Show contents of the flash memory holding FortiOS firmware images. One of the images will have Active set to yes , which means it is the used one.
diagnose hardware deviceinfo disk	Show all storage attached to the firewall, including disk type, volume, free space.

Session stateful table

Command	Description
get system session status / get system session6 status	Show current number of sessions passing the Fortigate (IPv4/IPv6). Run inside the VDOM in multi-vm environment to get number of connections/sessions for this specific VDOM.
get sys session-info statistics	Get general statistics on sessions: current number of, global limits, number of clashes (different sessions trying to use the same ports), TCP sessions stats per state
get sys session-info ttl	Show the default TTL setting for the connections in the table, default being 3600 seconds.

Command	Description
diagnose sys session filter <filter parameter> <filter value> / diagnose sys session6 filter <filter parameter> <filter value>	<p>Set filter to show/manipulate only specific connections in the stateful table. Run without any filter parameters this command displays the current filter applied if any. Parameters:</p> <p>vd - id number of the vdom. When entering the vdom with edit vdom, this number is shown first.</p> <p>sintf - source interface.</p> <p>dintf - destination interface.</p> <p>proto - protocol, by IANA protocol number.</p> <p>proto-state - protocol state.</p> <p>src - source IP.</p> <p>dst - destination IP.</p> <p>nsrc - NATed source IP.</p> <p>sport - source port.</p> <p>nport - NATed source port.</p> <p>dport - destination port.</p> <p>policy - policy id.</p> <p>duration <from> <to> - duration.</p> <p>expire <from> <to> - expiration time.</p> <p>session-state1 <x> - session state, where x is in hex, state bits.</p> <p>negate <parameter> - negate the match, i.e. match if a connection does NOT contain <i>parameter</i>. Where parameter is one of the mentioned above.</p>

Command	Description
diagnose sys session clear / dia sys session6 clear	Clear/delete connections from the session table. IMPORTANT: If no session filter is set (see above) before running this command, ALL connections passing the Fortigate will be deleted! Which means they will be disconnected. So use carefully.
diagnose sys session list / dia sys session6 list	List connections limited to the filter set if any, or all session table if not.

High Availability Clustering debug

Table 3. HA Clustering related debug and verification

Command	Description
get sys ha status	Show general status and statistics of the clustering - health status, cluster uptime, last cluster state change, reason for selecting the current master, configuration status of each member (in-sync/out-of-sync), usage stats (average CPU, memory, session number), status (up/down, duplex/speed, packets received/dropped) for the heartbeat interface(s), HA cluster index (used to enter the secondary member CLI with exe ha manage).
diagnose sys ha dump-by group	Print detailed info per cluster group, shows actual uptime of each member in start_time , as well monitored links failures, status.
diagnose sys ha checksum cluster	Shows configuration checksum for each cluster member separated in individual VDOMs and <i>global</i> . In properly synchronized cluster all member checksums should be identical, look at all value.
diagnose sys ha checksum recalculate	Force cluster member to recalculate checksums, often will solve the out of sync problem. No adverse effects. Run on each cluster member.
diagnose sys ha checksum show < VDOM/global>	Print detailed synchronization status for each configuration part. Use after seeing out-of-sync in diagnose sys ha checksum cluster to know which part of configuration causes members to be out-of-sync. Need to run on each cluster member and compare, long output - use diff /vimdiff/Notepad++ Compare plugin to spot the differences.

Command	Description
diagnose sys ha checksum show <VDOM/global> <settings part name>	Show exact setting inside the settings tree that causes out-of-sync. Use output from diagnose sys ha checksum show (see above) for <i>settings part name</i> . E.g. if diagnose sys ha checksum show root indicates that <i>firewall.vip</i> is out-of-sync, running diagnose sys ha checksum show root firewall.vip will give checksums of each VIP in the root domain to compare with those of secondary member.
diagnose debug app hatalk -1	Enable heartbeat communications debug. It shows in real time if members are talking over sync interfaces. The output will look like <i>state/chg_time/now=2(work)/1610773657/1617606630</i> , where the desired <i>state</i> is <i>work</i> , <i>chg_time</i> is last cluster state/failover date in epoch, and <i>now</i> is the last time communication occurred on heartbeat interface(s), also in epoch.
diag debug application hasync -1	Real time synchronization between members. As only things that changed get synchronized after 1st sync is established, may take time to produce output. See next.
execute ha synchronize stop diag debug enable diag debug application hasync -1 execute ha synchronize start	Stop, enable debug, then start again HA synchronization process, will produce lots of output.
exe ha manage ? exe ha manage <id>	First show index of all Fortigate cluster members, then enter any secondary member CLI via its index.
diagnose sys ha reset-uptime	Resets uptime of this member making it less than the other member(s)'s uptime and so fails over to those member(s). This is a temporary way to force cluster fail-over to another member from the current one. NOTE: check that the setting below is present or immediately after the reset and failover, this member will become active again if it has higher HA priority. <div>config sys ha set ha override disable</div>

IPSEC VPN debug

Table 4. IPSEC VPN Debug

Command	Description
diagnose vpn ike log-filter <parameter>	Filter VPN debug messages using various parameters: <ul style="list-style-type: none">• list Display the current filter.• clear Delete the current filter.• name Phase1 name to filter by.• src-addr4/src-addr6 IPv4/IPv6 source address range to filter by, usually you filter on Remote peer legal IP.• dst-addr4/dst-addr6 IPv4/IPv6 destination address range to filter by.• src-port Source port range• dst-port Destination port range• vd Index of virtual domain. -1 matches all.• interface Interface that IKE connection is negotiated over.• negate Negate the specified filter parameter.
diagnose debug application ike -1	Enable IPsec VPN debug, shows phase 1 and phase 2 negotiations (for IKEv1) and everything for IKEv2. "-1" sets the verbosity level to maximum, any other number will show less output.
diagnose vpn ike gateway flush name <vpn_name>	Flush (delete) all SAs of the given VPN peer only. Identify the peer by its Phase 1 name.
diagnose vpn tunnel list [name <Phase1 name>]	Show operational parameters for all or just specific tunnels: Type (dynamic dial up or static), packets/bytes passed, NAT traversal state, Quick Mode selectors/Proxy Ids, mtu, algorithms used, whether NPU-offloaded or not, lifetime, DPD state.
diagnose vpn ike gateway list	Show each tunnel details, including user for XAuth dial-up connection.
dia vpn tunnel shut <Phase2 name> <Phase1 name>	Bring the named tunnel down by its Phase2 and Phase2 name.
dia vpn tunnel up <Phase2 name> <Phase1 name>	Bring the tunnel up by its name.

Command	Description
get vpn ipsec tunnel details	Detailed info about the tunnels: Rx/Tx packets/bytes, IP addresses of the peers, algorithms used, detailed selectors info, lifetime, whether NAT Traversal is enabled or not.
get vpn ipsec stats tunnel	Short general statistics about tunnels: number, kind, number of selectors, state
get vpn ipsec tunnel summary	Short statistics per each tunnel: number of selectors up/down, number of packets Rx/Tx.
get vpn ipsec stats crypto	Crypto stats per component (ASIC/software) of the Fortigate: encryption algorithm, hashing algorithm. Useful to see if unwanted situation of software encryption/decryption occurs.

SSL VPN debug

Table 5. SSL VPN client to site/Remote Access debug

Command	Description
get vpn ssl monitor	List logged in SSL VPN users with allocated IP address, username, connection duration.
diagnose vpn ssl debug-filter <i>criteria</i>	<p>Limit debug output according to the <i>criteria</i> below:</p> <p>src-addr4 src-addr6 <i>source-ip-of-client</i> Source IP of the connecting client</p> <p>vd <i>VDOM name</i> Limit debug to a specific VDOM, specify VDOM by its string name, not numerical index.</p> <p>negate Negate the filter.</p> <p>clear Clear the filter.</p> <p>list List active filter.</p>
diagnose debug app sslvpn -1	Debug SSL VPN connection. Shows only SSL protocol negotiation and set up. That is - ciphers used, algorithms and such, does NOT show user names, groups, or any client related info.

Static Routing Debug

Table 6. Static and Policy Based Routing debug & diagnostics

Command	Description
get router info kernel get router info6 kernel	<p>View the kernel routing table (FIB). This is the list of resolved routes actually being used by the FortiOS kernel.</p> <p>tab Table number, either 254 for unicast or 255 for multicast.</p> <p>vf Virtual domain index, if no VDOMs are enabled will be 0.</p> <p>type 0 - unspecific, 1 - unicast, 2 - local , 3 - broadcast, 4 - anycast , 5 - multicast, 6 - blackhole, 7 - unreachable , 8 - prohibited.</p> <p>proto Type of installation, i.e. where did it come from: 0 - unspecific, 2 - kernel, 11 zebOS module, 14 - FortiOS, 15 - HA, 16 - authentication based, 17 - HA1</p> <p>prio priority of the route, lower is better.</p> <p>pref preferred next hop for this route.</p> <p>Gwy the address of the gateway this route will use</p> <p>dev outgoing interface index. If VDOMs enabled, VDOM will be included as well, if alias is set it will be shown.</p>
get router info routing-table all get router info6 routing	<p>Show RIB - active routing table with installed and actively used routes. It will not show routes with worse priority, multiple routes to the same destination if unused.</p>
get router info routing database get router info6 routing database	<p>Show ALL routes, the Fortigate knows of - including not currently used.</p>
get router info routing-table details <route>	<p>Show verbose info about specific route, e.g. get router info routing-table details 0.0.0.0/0</p>
diagnose ip rtcache list	<p>Show the routes cache table.</p>
get firewall proute get firewall proute6	<p>Get all configured Policy Based Routes on the Fortigate.</p>

Command	Description
exe traceroute-options [source <i>ip</i> / device <i>ifname</i> / view-settings / use-sdwan yes]	Run traceroute, setting various options if needed.
exe traceroute <i>host</i>	
exe tracert6 [-s <i>source-ip</i>] <i>host</i>	Run IPv6 trace route.
exe ping-options [data-size <i>bytes</i> / df-bit / interface <i>if-name</i> / interval <i>seconds</i> / repeat-count <i>integer</i> / reset / view-settings / timeout <i>seconds</i> / source <i>ip</i> / ttl <i>integer</i> / use-sdwan yes]	Set various options before running pings.
exe ping <i>host</i>	Run the IPv4 ping.
exe ping6-options <i>see available options above for ipv4</i>	Set various ping6 options before running it.
exe ping6 <i>host</i>	Run the IPv6 ping.

Interfaces

Table 7. Interfaces of all kinds diagnostics

Command	Description
get hardware nic <interface name>	Hardware info of the interface: MAC address, state (up/down), duplex (full, half), Rx/Tx packets, drops.
diagnose hardware deviceinfo nic <nic name>	Same as above.
get sys interface transceiver	List all SFP/SFP+ transceivers installed with info on: vendor name, serial number, temperature, voltage consumed, and, most important - Transmit (TX) and Receive (RX) signal power in dBm.
get hardware npu np6 port-list	Show on which interfaces the NPU offloading is enabled.
diagnose npu np6lite port-list	Same as above but for NP6-lite.
fnsysctl ifconfig <interface name>	Gives the same info as Linux ifconfig . The only way to see the actual MTU of the interface.
fnsysctl cat /proc/net/dev	Similar to netstat shows errors on the interfaces, drops, packets sent/received.
diagnose ip address list	Show IP addresses configured on all the Fortigate interfaces.
diagnose sys gre list	Show configured GRE tunnels and their state.

Command	Description
diag debug application pppoe -1	Enable all ADSL/PPPoE-related debug.
dia debug application pppoe -1	
dia debug applicaiton ppp -1	
execute interface pppoe-reconnect	Force ADSL re-connection.
diagnose sys waninfo	Show WAN interface info: public IP address of the WAN interface, guessed geo location of this IP, and whetehr this IP address is in FortiGuard black list.

LACP Aggregate Interfaces

Command	Description
diagnose netlink aggregate list	List all aggregate interfaces in the current VDOM, shows names, state (up/down), LACP mode and algorithm used
diagnose netlink aggregate name <aggregate interface name>	Shows details of the given aggregate interface under the entry actor state (preferred state is ASAIEE): LACP Mode (Active/Passive), LACP Speed mode (Slow [default]/Fast), Synced or Out of Sync, minimal physical interfaces to be up for the whole aggregate to be up, Aggregator ID (has to be identical on both sides), own and peer's MAC addresses, link failure count.
diagnose sniffer packet any "ether proto 0x8809" 6 0 a	Sniffer to see all LACP traffic on this Fortigate: 0x8809 LACP Ethernet protocol designation, 6 - maximum verbosity, 0 - do not limit number of captured packets, a - show time in UTC format, rather than delta from the 1st packet seen. LACP packets should arrive from the peer's MAC address on the aggregate logical interface name, and should leave from the physical interface(s) destined to the peer's MAC address. This capture will also show LACP actor state in arriving/leaving packets - for working LACP aggregate it should be ASAIEE in both directions.

diagnose netlink port <aggregate int name> src-ip <IP> dst-ip <IP>	Show what physical port a packet given by the filter will exit. Available filter keywords: src-ip - Source IP address. dst-ip - Destination IP address. src-mac - Source MAC address. dst-mac - Destination MAC. proto - Protocol number. src-port/dst-port - Source/Destination port. vlan-id - VLAN number.
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DHCP server, relay, client

Table 8. DHCP server, relay, client

Command	Description
show system dhcp/dhcp6 server	Show DHCP server configuration, including DHCP address pools.
execute dhcp/dhcp6 lease-list [interface name]	Show real-time list of allocated by Fortigate addresses via DHCP. It will show IP address of each client, its MAC address, device type/name (Android, iOS, Windows, etc.), the lease time and expiration.
execute dhcp/dhcp6 lease-clear all/start-end-IP-address-range	Clear DHCP allocations on the Fortigate. This will NOT cause clients that already have IP addresses to release them, but will just clear Fortigate DHCP database and will start over allocating again. You can either clear <i>all</i> IP addresses in the database, or only specific IPs.
diagnose debug application dhcps/dhcp6s -1	Enable real-time debug of DHCP server activity. This will show DHCP messages sent/received, DHCP options sent in each reply, details of requesting hosts.
diagnose debug application dhcprelay/dhcp6r -1	Enable real-time debug of the DHCP relay agent, dhcp6r is for DHCPv6.
diagnose debug application dhcpc/dhcp6c -1	Enable real-time debug when Fortigate is itself a DHCP Client.

Command	Description
dia sni pa any 'port 67 or port 68' 6 and for DHCPv6 dia sni pa any 'port 546 or port 547' 6	Run packet sniffer for DHCP or DHCPv6 packets reaching the Fortigate.

NTP debug

Table 9. NTP daemon diagnostics and debug

Command	Description
diag sys ntp status	Current status of NTP time synchronization. Shows all NTP peers and their detailed info: reachability, stratum, clock offset, delay, NTP version.
execute date	Show current date as seen by Fortigate.
exec time	Show current time as seen by Fortigate.

SNMP daemon debug

Table 10. SNMP daemon debug

Command	Description
diagnose debug application snmpd -1	ENable SNMP daemon messages debug.
show system snmp community	Show SNMP community and allowed hosts configuration

BGP

Table 11. BGP debug

Command	Description
diagnose ip router bgp level info diagnose ip router bgp all enable	Set BGP debug level to INFO (the default is ERROR which gives very little info) and enable the BGP debug.
exec router clear bgp all	Disconnect all BGP peering sessions and clear BGP routes in BGP table and RIB. Use with care, involves downtime.
get router info bgp summary	State of BGP peering sessions with peers, one per line.

Command	Description
get router info bgp network <prefix>	Detailed info about <prefix> from the BGP process table. Output includes all learned via BGP routes, even those not currently installed in RIB. E.g. <code>get router info bgp network 0.0.0.0/0</code> . The <prefix> is optional, if absent shows the whole BGP table.
get router info routing-table bgp	Show BGP routes actually installed in the RIB.
get router info bgp neighbors	Detailed info on BGP peers: BGP version, state, supported capabilities, how many hops away, reason for the last reset.
get router info bgp neighbors <IP of the neighbor> advertised-routes	Show all routes advertised by us to the specific neighbor.
get router info bgp neighbors <IP of the neighbor> routes	Show all routes learned from this BGP peer. It shows routes AFTER filtering on local peer, if any.
get router info bgp neighbors <IP of the neighbor> received-routes	Show all received routes from the neighbor BEFORE any local filtering is being applied. It only works if <code>set soft-reconfiguration enable</code> is set for this peer under <code>router bgp</code> configuration.
diagnose sys tcpsock grep 179	List all incoming/outgoing TCP port 179 sessions for BGP.

OSPF

Command	Description
get router info ospf status	Info about OSPF for the whole Fortigate: Router ID, Hello timer, stats of LSA originated/received, OSPF Areas configured, number of neighbors for each Area, whether authentication is enabled per Area.
get router ospf	Show all general OSPF process settings, default and not.
get router info ospf neighbor	Get info on all neighbors of this Fortigate - their IPs, state, Dead Interval timers.
get router info ospf interface <i>interface-name</i>	Show OSPF info for a given interface - Area, Router ID, timers, DR/BDR for broadcast nets, MTU as seen by OSPF.
get router info ospf route	Show OSPF routes installed into RIB.

Command	Description
diagnose ip router ospf level info	Set OSPF debug level to the highest - info. A must before running OSPF debug to see relevant information.
diagnose ip router ospf option	<p>Enable specific debug option. If in doubt just use dia ip router ospf all -1 to enable all OSPF debug options. Some options expect integer as info level as the last parameter, some options need enable as the last parameter. Options:</p> <p>all <i>n</i> - Enable all OSPF debug, <i>n</i> is the info level, for all set to -1.</p> <p>lsa - OSPF Link State Advertisement, sending/receiving LSAs.</p> <p>n fsm - OSPF Neighbor State Machine, not very useful.</p> <p>packet - OSPF Packets. Show OSPF packets traffic.</p> <p>events - OSPF events.</p> <p>ifsm - OSPF Interface State Machine. Not very useful, use get router info ospf interface instead.</p> <p>n fsm - OSPF Neighbor State Machine.</p> <p>nsm - OSPF NSM interface.</p> <p>route - OSPF route information.</p> <p>show - Show status of OSPF debugging.</p>

Admin sessions

Table 12. Admin sessions management

Command	Description
get sys info admin status	List logged in administrators showing INDEX value for each session
execute disconnect-admin-session <INDEX>	Disconnect logged in administrator by the session INDEX.

Authentication

Table 13. Authentication in all kinds LDAP, Radius, FSSO

Command	Description
diagnose firewall auth list	List all authenticated and known by firewall usernames. It does not matter what the source is - LDAP/SSO/etc. Also shows client's IP, idle time, duration.
diagnose debug app fnbamd -1	Enable debug for authentication daemon, valid for ANY remote authentication - RADIUS, LDAP, TACACS+.
diagnose test authserver ldap <LDAP server name in FG> <username> <password>	Test user authentication on Fortigate CLI against Active Directory via LDAP. E.g. test user Tara Addison against LDAP server configured in Fortigate as LDAP-full-tree having password secret: diagnose test authserver ldap LDAP-full-tree "Tara Addison" secret .
diagnose test authserver radius <RADIUS server object> <chap/pap/mschap2> <username> <password>	Test user authentication against the configured RADIUS server. E.g. to test user adminad1 with password secr3t against RADIUS server RAD1 : diagnose test authserver radius RAD1 mschap2 adminad1 secr3t Output: authenticate 'adminad1' against 'mschap2' succeeded, server=primary assigned_rad_session_id=9839905755137 session_timeout=0 secs idle_timeout=0 secs!
diagnose debug authd fsso list	List logged in users the Fortigate learned via FSSO
diagnose debug authd fsso server-status	Show status of connections with FSSO servers. Note: it shows both, local and remote FSSO Agent(s). The local Agent is only relevant when using Direct DC Polling, without installing FSSO Agent on AD DC, so it is ok for it to be waiting for retry ... 127.0.0.1 if you don't use it. The working state should be connected .
diagnose debug authd fsso refresh-logon	Refresh user login information.
diagnose debug authd fsso refresh-group	Refresh groups and groups memberships info.

Web and URL Filtering debug

Table 14. Web Filtering debug

Command	Description
diagnose debug rating	Shows if the Fortiguard-based Web filtering is enabled, the contract/subscription status, whether the Anycast or Unicast used, IPs of Fortigaurd servers and the communication status.
diag autoupdate versions	Show current databases versions and the last time they were updated.
execute update-now	Force download and update of all the databases (AV, IPS, etc.)
diagnose debug application update -1 dia debug enable execute update-now	Enable updates debug and then force the updates.
execute ping service.fortiguard.net execute ping update.fortiguard.net execute ping guard.fortinet.net	Check DNS resolving of the Fortiguard servers names, and connectivity to them (note: those servers usually do answer pings, but it may change any time).
diag webfilter fortiguard cache dump	Show cache of web sites ratings responses from the Fortiguard.
dia test app urlfilter 2	Clear the cache, no downtime.
dia test app urlfilter 99	Restart the URL filtering daemon, causes short downtime.
dia deb app urlfilter -1	Enable URL filering daemon debug, showing all processing steps, a lot of output as shows everything.

Fortianalyzer logging debug

Table 15. Verify and debug sending logs from Fortigate to Fortianalyzer

Command	Description
get log fortianalyzer setting	Show active Fortianalyzer-related settings on Fortigate.
config log fortianalyzer	Complete Fortianalyzer configuration on CLI, as GUI configuring is usually not enough for it to work.

Command	Description
get log fortianalyzer filter	Verify if any log sending filtering is being done, look for values of filter and filter-type . If there are any filters, it means not all logs are sent to FAZ.
exec log fortianalyzer test-connectivity	Verify that Fortigate communicates with Fortianalyzer. Look at the statistics in Log: Tx & Rx line - it should report increasing numbers, and make sure the status is Registration: registered .
exec telnet <IP of Fortianalyzer> 514	Test connectivity to port 514 on the Fortianalyzer. If pings are allowed between them, you can also try pinging.
diagnose sniffer packet any 'port 514' 4	Run sniffer on Fortigate to see if devices exchange packets on port 514. Click in GUI on Test Connectivity to initiate connection.

SD-WAN verification and debug

Table 16. SD-WAN verification and debug

Command	Description
diagnose sys sdwan health-check (6.4 and newer)	Show state of all the health checks/probes. Successful probes are marked alive , failed probes are marked dead . Also displays packet-loss, latency, jitter for each probe.
diagnose sys virtual-link health-check (5.6 up to 6.4)	
diagnose sys sdwan member	Show list of SD-WAN zone/interface members. Also gives each interface gateway IP (if was set, 0.0.0.0 if not), priority , and weight both by default equal 0 , used with some SLA Types.
diagnose sys virtual-wan-link member (5.6 up to 6.4)	
diagnose sys sdwan service	List configured SD-WAN rules (aka services), except the Implied one which is always present and cannot be disabled, but is editable for the default load balancing method used. Shows member interfaces and their status alive or dead for this rule.
diagnose sys virtual-wan-link service (5.6 up to 6.4)	
diag sys sdwan intf-sla-log <interface name>	Print log of <interface name> usage for the last 10 minutes. The statistics shown in bps:
diag sys virtual-wan-link intf-sla-log <interface name> (5.6 up to 6.4)	inbandwidth, outbandwidth, bibandwidth, tx bytes, rx bytes.

Command	Description
diag netlink interface clear <interface name>	Clear traffic statistics on the interface, this resets statistics of the SD-WAN traffic passing over this interface. Needed, if, for example, you changed SD-WAN rules, but not sure if it's already active. E.g. <code>diag netlink interface clear port1</code> .
diagnose firewall proute list	List ALL Policy Based Routes (PBR). SD-WAN in Fortigate, after all, is implemented as a variation of PBR. This command lists manual (classic) PBR rules, along with SD-WAN created via SD-WAN rules. Important: Manually created PBR rules (via <code>Network</code> → <code>Policy Routes</code> or on CLI <code>config route policy</code>) always have preference over the SD-WAN rules, and this command will show them higher up.

Virtual Fortigate License Status

Table 17. Verify status of VM Fortigate License

Command	Description
get sys status grep -i lic	Get status of the license (for VM only). The correct status is <code>Valid</code> .
diagnose debug vm-print-license	Show detailed info on VM Fortigate license status: allowed CPUs and memory, date of license activation, license expiration date (if set), serial number.
diagnose hardware sysinfo vm full	Show license data as seen by FortiGuard: status (should be <code>valid=1</code>), last time it was checked (<code>recv</code>), answer code, should be <code>code: 200</code> , <code>code: 401</code> is for duplicate license found, <code>code: 502</code> is for VM cannot connect to FortiGuard, and <code>code: 400</code> is for invalid license.

SIP ALG and helper

Table 18. SIP proxy or helper debug

Command	Description
config sys settings get grep alg	Show the current SIP inspection mode. If the output is default-voip-alg-mode: proxy-based then the full Layer 7 proxy SIP inspection is on (ALG inspection). If the output is default-voip-alg-mode: kernel-helper-based then the Layer 4 <i>helper</i> inspection is on. In both modes Fortigate does IP address translation inside SIP packets (if needed), and opens dynamically high ports for incoming media/voice streams ports. In <i>ALG</i> mode, the Fortigate additionally does RFC compliance verification and more. So, the <i>ALG</i> mode is more prone to cause issues but also provides more security.
show system session-helper grep sip -f	If using SIP <i>helper</i> and not <i>ALG</i> , make sure there is an entry for SIP in the helpers list, usually on port 5060, but may be custom as well.
diagnose debug application sip -1	Display SIP debug in real-time (lots of output). It shows IP replacement inside SIP packets if NAT involved, all SIP communication requests (REGISTER, INVITE etc.), and reply codes.

DNS server and proxy debug

Command	Description
get system dns	Show configured DNS servers, DNS cache limit and TTL, source IP used, timeout and retry, whether NDS over TLS is enabled.
diagnose test app dnsproxy	Will present all debug options for dnsproxy. Below are some of more useful of them.
diagnose test app dnsproxy 2	Show the following statistics: number of DNS process workers (if multiple), DNS latency against each server used, Secure DNS IP and latency - DNS server used for DNS filtering and Botnet detections, DNS cache usage, UDP vs TCP requests statistics, name of DNS Filter applied if any.
diagnose test app dnsproxy 1	Clear DNS responses cache
diagnose test app dnsproxy 3	Display detailed statistics for each DNS/SDNS server used and those that could be used.
diagnose test app dnsproxy 7	Show the responses cached entries.

Command	Description
diagnose test app dnsproxy 6 4 5	Work with FQDN resolved objects: 6 - Display currently resolved FQDN addresses 4,5 - Reload/Requery all FQDN addresses
diagnose test app dnsproxy 8	Show DNS database of domain(s) configured on the Fortigate itself.
diagnose test app dnsproxy 9	Reload DNS database of domain(s) configured on the Fortigate itself.
diagnose test app dnsproxy 10	Show active SDNS, i.e. DNS Filter Policy used. Shows Categories as numbers, so not easily readable.
diagnose test app dnsproxy 12	Reload configuration of DNS Filter, in case the changes made do not take effect immediately.
diagnose test app dnsproxy 15	Show cached responses and their rating of the DNS Filter for each URL/domain scanned.
diagnose test app dnsproxy 16	Clear the DNS Filter responses and ratings cache.
diagnose test app dnsproxy 99	Restart the dns proxy service.
diagnose test app dnsproxy -1	Enable all possible debug, a lot of output.

Administrator GUI, SSH access and API automation requests debug

Command	Description
diagnose debug application httpsd -1	Enable diagnostics for administrator and remote REST API access via api-user . When debugging API automation, refrain from working in admin GUI as it will produce a lot of unrelated output.
diagnose debug application sshd -1	Debug SSH administrator session.
dia debug cli 8	Nice trick: this will print CLI commands the Fortigate runs when you do something in the GUI. This way we can find CLI commands without long search in Google or documentation.

Wireless Controller and managed Access Points debug

Command	Description
diagnose wireless-controller wlac -c ap-status	Show list of all Access Points (APs) this Fortigate is aware of with their BSSID (MAC), SSID, and Status (accepted , rogue , suppressed)
diagnose wireless-controller wlac -c vap	Show list of APs with their BSSIDs, broadcasted SSIDs, IDs, and unlike wlac -c ap-status above, also shows management IP and port which can be later used for real-time debug.
show wireless-controller wtp-profile	Show available Wireless Termination Points (i.e. APs) profiles with their settings. Profiles are applied to individual APs, i.e. a single profile can be applied to multiple APs.
show wireless-controller wtp	Show APs known to this Fortigate individually. We can enter any given AP configuration and change settings for this AP only, i.e. set admin disable .

FortiTokens

Command	Description
diagnose fortitoken info	<p>Show all existing on the Fortigate Fortitokens, including their status:</p> <p>new - new token, available to be assigned to a user.</p> <p>active - normal state, assigned to a user, hardware Fortitoken.</p> <p>provisioning - Fortitoken Mobile (FTM), assigned to a user, waits for end user to activate it on his/her mobile phone.</p> <p>provisioned - FTM, assigned to a user and activated by him/her as well.</p> <p>provision timeout - user hasn't activated the assigned token in the given time window (3 days default), the token needs to be re-provisioned to a user again.</p> <p>locked - token was locked either manually by administrator, or because Fortigate was not able to reach Fortiguard servers.</p>

Command	Description
exec ping fds1.fortinet.com	Verify that Fortigate can resolve and ping the FortiGuard servers responsible for FortiToken activation/license validation.
exec ping directregistration.fortinet.com	
exec ping globalftm.fortinet.net	
show user fortitoken	Display all Fortitokens info on license number, activation expiration (in epoch format).

Automation stitches debug

Command	Description
diag test app autod 1	Enable automation stitches logging.
diag debug cli 7	Show stitches' running log on the CLI.
diag debug enable	Enable debug.
diagnose automation test <i>stitch-name log-if-needed</i>	Run the specified <i>stitch name</i> , optionally adding log when using Log based events.

Alerts Sending debug

Command	Description
dia debug app alertmail -1	Enable sessions debug for sending alerts by mail. This will show the configured settings, like from/to email address, as well as SMTP session log of connecting to the remote mail server and received/sent SMTP session codes.

fnsysctl all possible options

Command	Description
fnsysctl ifconfig [int-name]	Show detailed information on all/specific interface - errors, MTU, and more.
fnsysctl ls [path]	List files/folders in the filesystem. Useful for post-incident investigation of Fortigate compromises, looking for a given CVE indicators of compromise (IOCs).

Command	Description
fnsysctl cat <filename>	<p>Show contents of a file, not all files in the filesystem are accessible. Some examples:</p> <ul style="list-style-type: none"> * Show Linux kernel version of the Fortigate: <code>fnsysctl cat /proc/version</code> * Show open TCP connections to/from Fortigate itself (use <code>diagnose sys tcpsock grep 0.0.0.0</code> instead): <code>fnsysctl cat /proc/net/tcp</code> * Show CPU info: <code>fnsysctl cat /proc/cpuinfo</code> * Get memory information: <code>fnsysctl cat /proc/meminfo</code>
fnsysctl date	Show date in the Linux format, ignores any options.
fnsysctl df -h	Show filesystem usage, useful when you have harddisk(s) attached to the Fortigate.
fnsysctl du	<p>Show directories usage, accepts following options:</p> <ul style="list-style-type: none"> <code>-d n</code> - Limit depth to n levels deep. <code>-a</code> - Show/count files as well, not only directories. <code>-s</code> - Show only the summary usage of all directories/files. <code>-L</code> - Follow all symlinks
fnsysctl pwd	Show current working directory. Not very useful as we don't have access to <code>cd</code> and thus cannot change directory anyway.
fnsysctl ps	List running processes. Useful together with the next command <code>kill</code> for restarting some stuck process on Fortigate. Most of the processes in Fortigate are run via Watch Dog which means killing them will shut the running process and will restart it immediately later.
fnsysctl kill <process-id>	Kill a process by its ID (PID). The only option accepted is <code>-s N</code> where N is the signal number to send as per Linux.

Command	Description
fnsysctl killall <process-name>	Kill/restart a process by name. When using killall it is not recorded in the crash log file (which you read with diagnose debug crashlog read). Not all processes can be killed with it, e.g. hasync.
fnsysctl mv <src> <dst>	Move file in the filesystem. Most of the directories on the Fortigate are read-only, but some, like tmp are not. This command will ask for the administrator username/password explicitly.
fnsysctl printenv	Print environment variables. The only environment variable I was able to catch with this was type of Terminal used.
fnsysctl grep <regex> <file>	<p>Search contents of a file/files. The usual grep options are available:</p> <ul style="list-style-type: none"> -i Ignore case distinctions -l List names of files that match -H Prefix output lines with filename where match was found -h Suppress the prefixing filename on output -n Print line number with output lines -q Quiet -v Select non-matching lines -s Suppress file open/read error messages -c Only print count of matching lines -A Print NUM lines of trailing context -B Print NUM lines of leading context -C Print NUM lines of output context