Implemented M-plane Features

Feature name	Ref. Chapter O-RAN.WG4.MP.0-R003-v17.01	Description	Comment
Secure Shell (SSH)	5.4.2	Establishes an encrypted connection for terminal access, file transfers (via SCP/SFTP), and tunnelling, using key-based or password authentication.	
File Transfer Protocol (SFTP, FTPeS)	5.4.4	Network protocol that enables secure file transfers over SSH.	
Transport establishment	6.2.1	IP address exchange between RU and DU/SMO, to prepare for TCP connection establishment.	Automatic exchange on 10G port, manual on 1G port.
O-RU identification in DHCP	6.2.2	RU obtains IP address from DHCP server.	
Management plane VLAN discovery aspects	6.2.3	RU discovers the VLAN ID used for M-plane	
O-RU management plane IP address assignment	6.2.4	O-RU gets IP address from either DHCPv4 or DHCPv6 server	
O-RU controller discovery	6.2.5	O-RU discovers the O-RU controller by reading the DHCP offer fields	
NETCONF Call Home	6.3	The O-RU (NETCONF server) initiates a secure connection to a predefined set of NETCONF clients.	
Password based NETCONF authentication over SSH	6.4.2	User defined password as authentication mechanisms for establishing NETCONF sessions between the O-RU and NETCONF clients.	Currently only password based authentication is supported.
User account provisioning	6.4.3	Enables a NETCONF client with appropriate privileges to create, configure, and manage user accounts on the O-RU, specifying parameters such as username, password, authentication method (password, certificate, or SSH public key), privilege group, and account status.	Currently only password based authentication is supported.
NETCONF access control	6.5	The NETCONF access control mechanism enables the NETCONF server to limit some operations for one client but allow full access for another client.	
NETCONF capability discovery	6.6, 9.2	NETCONF capabilities O-RU sends in the NETCONF Hello message, including the framework for optional feature handling.	
Monitoring NETCONF connectivity	6.7	A NETCONF client that has subscribed to receive the supervision-notification, the O-RU operates watchdog timers (supervision timer and notification timer) to ensure that the session to the NETCONF client is persistent.	

Feature name	Ref. Chapter O-RAN.WG4.MP.0-R003-v17.01	Description	Comment
Closing a NETCONF session	6.8	A NETCONF client closes an existing NETCONF session by issuing the RPC close-session command.	
Transceiver (SFP) management	7.2, 7.11	SFP identification, monitoring and bandwidth management.	Notification not supported
C/U-Plane VLAN configuration	7.3	VLAN tagging of C/U data stream.	
Definition of processing elements	7.5	Needed to uniquely associate specific transport flows during traffic configuration.	Implemented processing element definition based on VLAN and MAC, other options not supported.
Delay parameters report	7.7.2	Store and report RU delay profile.	
Software management	8	A set of operations allowing the desired software package to be downloaded, files to be installed and slot containing installed software to be activated at O-RU.	
Config. Management - NETCONF operations	9.1.1	Set of NETCONF operations for managing O-RU's configurable parameters (datastore).	
Config. Management - Retrieve state	9.1.2, 9.1.4	Support for NETCONF and commands.	
Config. Management - Modify state	9.1.3	Control and monitoring of O-RU state as defined in ietf-hardware yang model, the states are: admin-state, power-state, oper-state, availability-state, usage-state.	
Config. Management - Modify parameters	9.1.5, 9.1.6, 9.1.8	Modify or delete configuration parameters (support for NETCONF command).	
Notification framework - dynamic	9.1.7	Framework which enables users to subscribe to O-RU's notifications.	
M-Plane operational state	9.3	Handling of client information (e.g. IP address).	
Resetting O-RU	9.5	Restart procedure initiated by NETCONF client (O-RU controller) or O-RU itself.	
Fault management framework	11.2, 11.3, 11.4	Handles alarm subscription and sends alarm notifications to subscribers.	
File upload	12.3	File upload mechanism using sFTP server.	
Sync status	13.2	Reporting synchronisation status of O-RU (LOCKED, HOLDOVER, FREERUN).	

Feature name	Ref. Chapter O-RAN.WG4.MP.0-R003-v17.01	Description	Comment
Troubleshooting log management	14.2.2	Collection of all available logs in RU.	
Retrieval of O-RU information	15.1	Retrieval of functional RU capabilities needed for U-plane configuration.	
U-Plane endpoint addressing	15.2.3	The eAxC_ID assignment.	
Carrier configuration	15.3	Carrier creation, activation and deactivation (U-plane traffic setup procedure).	
Received power measurements for shared spectrum bands	21	In case of shared spectrum (e.g. CBRS), measuring received power can be used to assess usage level of the shared spectrum.	