

VMware AirWatch Advanced Remote Management Guide

Installing, configuring, and using the Advanced Remote Management Service v4.4

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Chapter 1:

Introduction to Advanced Remote Management

Advanced Remote Management (ARM) allows you to connect to end-user devices remotely to aid in troubleshooting and maintenance. ARM is a premium upgrade that uses a new remote management client with enhanced functionality.

The Remote Management client also has additional support tools and device information available. The combination of remote control and information allows you to troubleshoot any issues on devices quickly and accurately.

Advanced Remote Management is already configured for SaaS customers who have purchased the upgrade.

ARM requires devices to have the AirWatch Agent and the Remote Management client installed.

Typical Deployment

Most users typically deploy the Advanced Remote Management (ARM) server in an enterprise network to facilitate the communication between the various components.

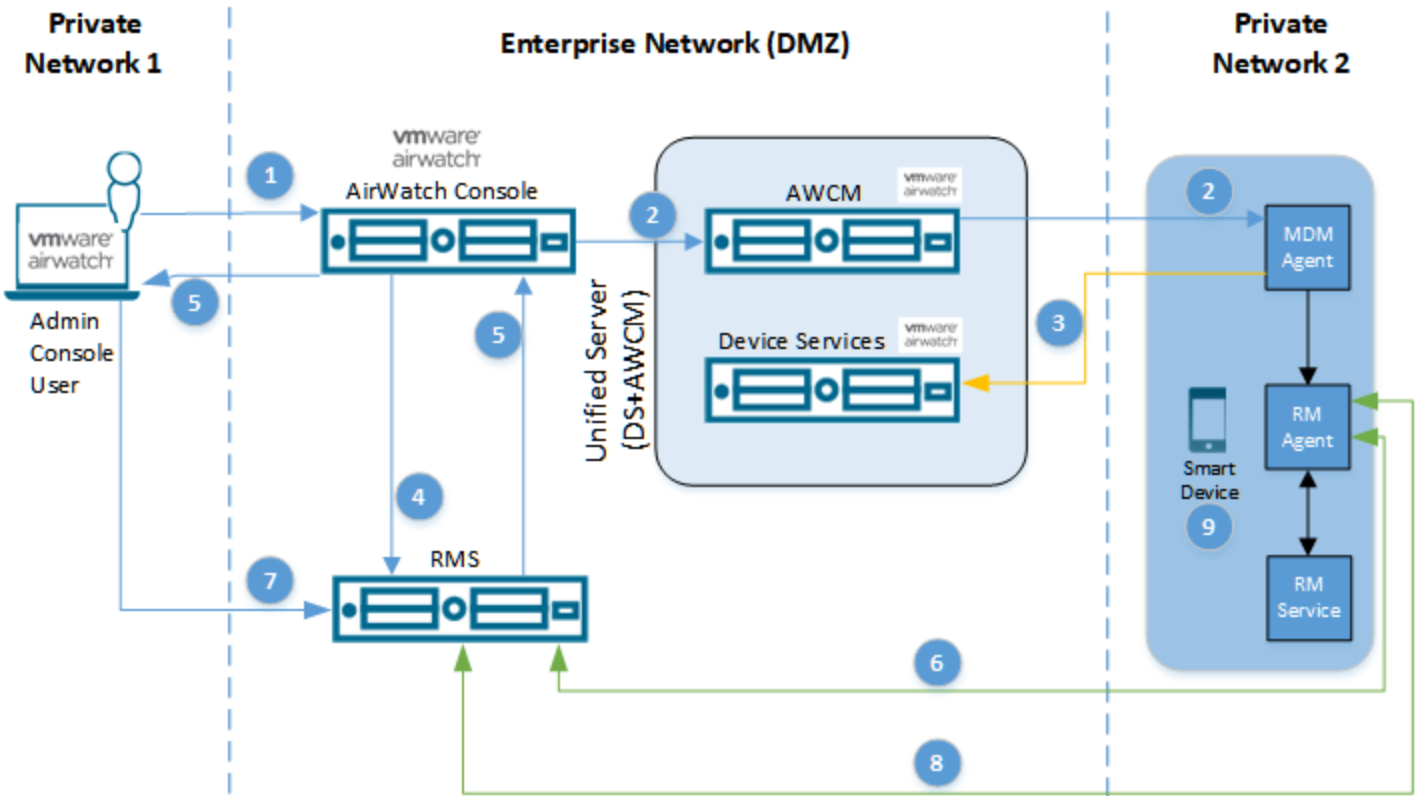
Without Load Balancer

This sample diagram is a typical deployment without the use of a load balancer.

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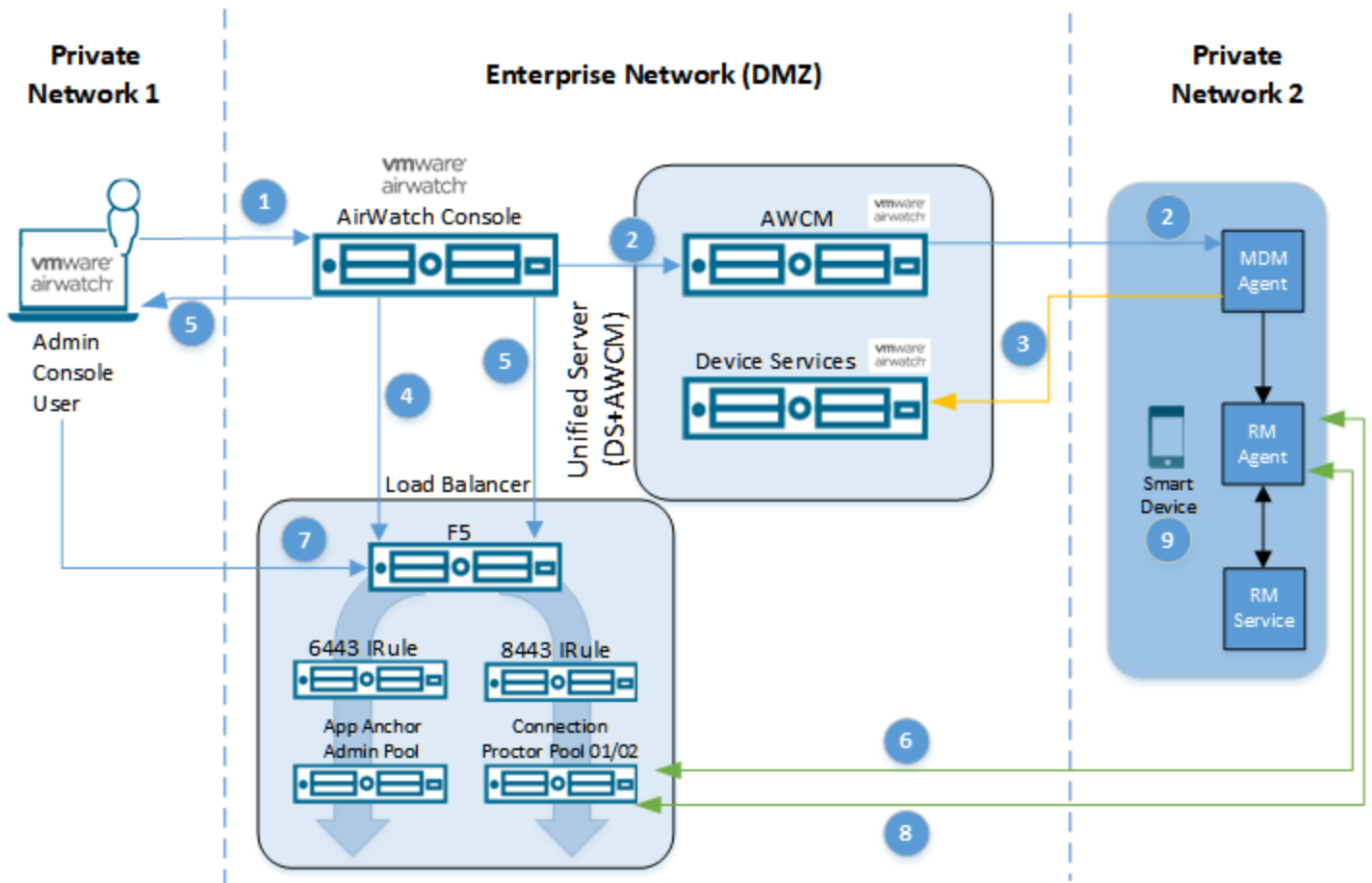
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- | | |
|--------------------------------------|---|
| 1. Queue RM Command | 6. Request Remote Management Session URL |
| 2. Queuing Command to Connect to RMS | 7. Admin Joins Remote Management Session |
| 3. Confirm Command | 8. Device Joins Remote Management Session |
| 4. Create Remote Management Session | 9. Send Commands/Get Frames |
| 5. Send Session URL | |

With Load Balancer

This sample diagram is a typical deployment that includes a load balancer. For more information, see [Load Balancer](#) on page 16.



CAP Servers contain Core Services, Application Services, and Portal Services and can be load balanced.

CP Services cannot be load balanced with the F5 since they use built-in software load balancing.

- | | |
|--------------------------------------|---|
| 1. Queue RM Command | 6. Request Remote Management Session URL |
| 2. Queuing Command to Connect to RMS | 7. Admin Joins Remote Management Session |
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| 5. Send Session URL | |

Advanced Remote Management Supported Platforms

Advanced Remote Management (ARM) supports Windows Rugged and Android devices running the proper AirWatch Agent and Advanced Remote Management service.

iOS devices can be viewed using Remote View, a feature in VMware Workspace ONE UEM console, and requires an Advanced Remote Management server.

ARM supports the following platforms.

- iOS devices running v7.0.0 or later with the AirWatch Agent v4.9.3 or later (for Remote View only).
- Windows Mobile/CE running .NET 2.0+ with the AirWatch Agent v6.0.4 installed.
- Android devices with the AirWatch Agent v7.0 or later installed.
 - Samsung Knox Devices – ARM can access only the personal side of Knox Dual Persona Mode.
 - Android (previously known as Android Enterprise and Android for Work) – ARM can access only the Work Managed mode running on Android v6.0 (Marshmallow) or later.

You must also download the required Advanced Remote Management CAB (for Windows Rugged) or APK (for Android) from the My Workspace ONE™ documentation repository (<https://my.workspaceone.com/>).

Advanced Remote Management Components

Advanced Remote Management (ARM) uses multiple components to facilitate the communication between admins and end-user devices. The core components are as follows.

Database

The database handles system and tenant configuration, operations, and logging such as the accrual of historical device enrollment data.

Core Services

The Core Services component provides service discovery and auxiliary services for the ARM solution through Web services and Windows services. These services include the following.

- **Management Entity (ME)** – Windows service that provides an in-memory datastore for admin and management Web service, which provides the operational end point to the system.
- **Service Coordinator (SVC)** – This Windows service is responsible for coordinating communication between various elements within the system. It provides the communication to the database and is responsible for the discovery of all other Remote Management Tool services. All ARM Tool services register with this service. Service coordinator service is installed on an Application (App) Server.
- **Data Tier Proxy (DTP)** – This Windows service works with the Service Coordinator. It serves as the gateway for all services to reach the Service Coordinator service to communicate with Remote Management Tool databases. Data Tier Proxy service is installed on the App Server.
- **Data Access Proxy (DAP)** – This Web service is responsible for a proper communication of all Web services. It serves a similar purpose as the Data Tier Proxy service and is installed on the App server.

Portal Services

The Portal Services component handles the administrative and management services for ARM. The Management Website is installed as part of the portal services component and consists of the following.

- **AetherPal Tool Controller Service (ACS)** – Acts as a gateway service that maintains a consistent socket connection between the RS web console and the Connection Proctor.
- **Management Web Site (ADM/ANC)** – IIS Service that hosts the RS web console for managing and remoting into devices. Anchor service responsible for mobile device registration. Additionally, it contains the System Admin Service (SAS) admin web portal for accessing and administering the tool and defining tenant and service configuration.
- **T10 Interface** – defines an integration portal between Workspace ONE™ UEM and the ARM server.
 - The T10 interface uses Representational State Transfer (REST) communication with a JavaScript Object Notation (JSON) payload. The T10 interface allows Workspace ONE UEM to make a mobile device eligibility call.
 - The T10 interface can also start a remote support session using the ARM tool and delete the device from the ARM system.

Application Services

Messaging Entity (MSG) is a core Windows service that provides the means for the ARM tool to send out SMS messages to the device via API or direct communication. This communication is accomplished with a messaging gateway, such as Google Cloud Messaging (GCM), or any proprietary SMSC aggregator.

Connection Proctor

The Connection Proctor component uses the Windows Connection Proctor service to manage device connections to the ARM server. The component also simultaneously handles multiple requests for sessions.

Advanced Remote Management Requirements

You must meet the listed requirements before using Advanced Remote Management (ARM).

General Requirements

For SaaS customers, the general requirements are the only requirements that must be met.

Requirements	Minimum
Supported Browsers	Latest version of Google Chrome, Safari, Internet Explorer, or Edge.
Workspace ONE™ UEM version	Workspace ONE UEM v9.0.2+ with the Workspace ONE UEM Rugged EMM Bundle. Ensure that your version of Workspace ONE UEM includes these features by contacting your account representative.

Hardware Scaling Requirement

Use the following requirements as a basis for creating an effective remote management system that scales to your environment. These requirements do not include network equipment such as load balancers or monitoring servers.

# Devices / # of Concurrent RC Sessions.	Core Svr (all in one)	DB Svr	CP Svr	Portal Svr	App Svr
Less than 1000 / Less than 100.	1 server. (2 CPUs, 10GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL 2012-2016 Express (if DB is on same server).	1 server, optional. (2 CPUs, 8GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Express.	n/a	n/a	n/a
1000 - 10,000 / Less than 100.	1 server. (2 CPUs, 10GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL 2012-2016 Standard (if DB is on same server).	1 server, optional. (2 CPUs, 8GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	n/a	n/a	n/a
10,000 - 50,000 / Less than 100.	1 server. (2 CPUs, 12GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	1 server, optional. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	n/a	n/a	n/a
50,000 - 100,000 / Less than 100.	1 server. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	1 server, optional. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	n/a	n/a	n/a

# Devices / # of Concurrent RC Sessions.	Core Svr (all in one)	DB Svr	CP Svr	Portal Svr	App Svr
100,000 - 500,000 / Less than 100.	n/a	SQL cluster. (2 CPUs, 32GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	1 server. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	1 server. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	n/a
500,000 - 1 million / Less than 100.	n/a	SQL cluster. (4 CPUs, 32-64GB RAM, 1TB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	1 server. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	1 server. (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	n/a
Greater than 1 million / Additional CP and Portal Svr required for more than 100 concurrent RC sessions.	n/a	SQL cluster. (4 CPUs, 64GB RAM, 1TB HDD): * Windows 2012 or 2016 w/GUI. * MS SQL Srv 2012- 2016 Standard.	1+ server(s). (2 CPUs, 16GB RAM, 500GB HDD): * Windows 2012 or 2016 w/GUI.	1+ server(s). (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.	1+ server(s). (2 CPUs, 16GB RAM, 250GB HDD): * Windows 2012 or 2016 w/GUI.

Hardware Requirements

Hardware	Minimum
Advanced Remote Management Server	
CPUs	2.4 GHz Processors, 4 Logical Processors, 2 CPU 2 Core 2x2 or 4 Physical depending on machine type VM vs Physical.
Memory	16 GB
Hard Drive IOPS	15,000 rpm SAS minimum
Hard Drive Space	100 GB for OS drive
Advanced Remote Management Database Server	
CPUs	2.4 GHz Processors, 4 Logical Processors, 2 CPU 2 Core 2x2 or 4 Physical depending on machine type VM vs Physical.
Memory	16 GB

Hardware	Minimum
Hard Drive IOPS	15,000 rpm SAS minimum
Hard Drive Space	200 GB for databases
Bandwidth	
Average Remote Session Requirement	1 MB/per minute (17 kbps)

Software Requirements

Ensure that you meet the following on-premises installation requirements.

Requirement	Description
Advanced Remote Management Server	
Internet Protocol	IPv4 is the required protocol for the Advanced Remote Management server. IPv6 must be disabled.
Operating System	Microsoft Windows Server 2016 or 2012 R2.
Software	<p>Microsoft .NET Framework 4.6.2</p> <p>Microsoft Report Viewer 2010 Redistributable Package.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Multi-Node Configuration: the Microsoft Report Viewer 2010 Redistributable Package must be installed where Portal Services are installed.</p> </div>
Server Roles	<ul style="list-style-type: none"> Application Server. Web Server IIS.

Requirement	Description
Features	<ul style="list-style-type: none"> • .NET Framework 3.5 Features. <ul style="list-style-type: none"> ◦ .NET Framework 3.5 (includes .NET 2.0 and 3.0). ◦ HTTP Activation. ◦ Non-HTTP Activation. ◦ IIS Management Console. • .NET Framework 4.5 Features. <ul style="list-style-type: none"> ◦ .NET Framework 4.5. ◦ ASP .NET 4.5. ◦ WCF Services. <ul style="list-style-type: none"> ■ HTTP Activation. ■ Message Queuing (MSMQ) Activation. ■ Named Pipe Activation. ■ TCP Activation. ■ TCP Port Sharing. • Message Queuing Services. • Windows Process Activation Service. <ul style="list-style-type: none"> ◦ Process Model. ◦ .NET Environment 3.5. ◦ Configuration APIs.
Advanced Remote Management Database	
Operating System	<ul style="list-style-type: none"> • Microsoft Windows Server 2016 or 2012 R2. • MS SQL Server 2012 Standard, or MS SQL Server 2014 Standard and Enterprise, or MS SQL Server 2016 Standard and Enterprise, or MS SQL Server Express 2012 or later (only for deployments with less than 2000 devices). • MS SQL Management Studio 17 (but only when SQL Server Express 2012 or later is used). • Microsoft .Net Framework 4.6.2. • Microsoft SQL Server Management Objects (SMO) DLL.

Requirement	Description
Server Roles	<ul style="list-style-type: none"> • Sysadmin. • Bulkadmin. • Dbcreator.
User Mapping	<ul style="list-style-type: none"> • Downer. • Dbbackupoperator. • SQLAgent dependent. • serverGroup dependent.
Users	<p>Apdbuser Server role: Db_creator. Database role: Db_owner for all aetherpal user databases. On MSDB, database role to create SQL jobs.</p> <p style="padding-left: 40px;">[SQLAgentOperatorRole] [SQLAgentReaderRole] {SQLAgentUserRole}</p> <p>Apadminuser Server role: Db_creator, to create multitenant databases. Database role: Db_owner for all aetherpal user databases. On MSDB, database role to create SQL jobs.</p> <p style="padding-left: 40px;">[SQLAgentOperatorRole] [SQLAgentReaderRole] {SQLAgentUserRole}</p>

Network Requirements

Source Component	Destination Component	Protocol	Port
Workspace ONE UEM console	ARM Server	TCP	443
End-User Devices	ARM Server	TCP	443, 8443
Console User	ARM Server	TCP	443
ARM Server	ARM Database	TCP	1433
ARM Server	ARM Server <i>Note: these ports are internal and within the RMS for service-to-service communication.</i>	TCP	80, 636, 8865, 8866, 8867, 8870, 12780

Security Zones: Private vs. Public

The ARM system is deployed over a single server with two zones, Public/DMZ and Private/Admin. Public zone components include Admin and Anchor Services and Connection Proctor while Private zone components include Database and Data Services. Security zones are separated by hardware and/or software firewalls only allowing specific traffic on specific ports in the prescribed direction.

Internal Ports

The chart below summarizes what ports are utilized by which services.

Port #	Incoming Components/Services	Outgoing Components/Services
53/389/636	Directory Services (DS) Domain Name Service (DNS)	Data Tier Proxy (DTP) Service Coordinator (SVC) Aetherpal Tool Controller (ACS)
80 or 8080 (depending upon your configuration)	Management Services (configurable)	Data Access Proxy (DAP) Management Entity (ME)
1433	Database Server (DB)	Admin/Anchor (ADM/ANC)
8865	Data Tier Proxy (DTP)	Admin/Anchor (ADM/ANC) Management Entity (ME) Connection proctor (CP) Service Coordinator (SVC) AetherPal Tool Controller (ACS)
8866	Messaging Entity (MSG)	Admin/Anchor (ADM/ANC)
8867	Data Access Proxy (DAP)	Data Tier Proxy (DTP)
8870	Service Coordinator (SVC)	Admin/Anchor (ADM/ANC) Management Entity (ME) Connection Proctor (CP)
12780	Connection Proctor (CP)	Management Entity (ME)

In a multiple server environment, the servers hosting the components within the private zone occupy their own LAN segment or VLAN without access to the outside world. Ports between servers within the private zone are opened per firewall rules.

Multi-Node Configuration: Install the Connection Proctor component on a sever separate from the server hosting the other components.

IP Address and Port Translation

The Advanced Remote Management system requires that one static IP address is reachable from the mobile device network and the user network from which users access the ARM web portal.

This IP addresses is translated to the all-in-one server's Portal (web) services and Connection Proctor (CP) services. Incoming web traffic for Admin/Anchor and the Connection Proctor require that the following ports be open.

443 – Admin/Anchor (ADM/ANC)

8443 – Connection Proctor (CP)

Note: If devices and the CP server are located internally and can access these services, then these ports do not need to be publicly available.

Firewall Rules

Firewall rules can be summarized based on the number of allocated IP addresses to the ARM system.

Source	Destination	Protocol	Port	Direction	Rule
Device Network / Internet	CP Service	TCP/TLS/SSL	8443	Inbound	Accept
User Network / Device Network / Internet	Portal Service	TCP/HTTPS	443	Inbound	Accept
Workspace ONE portal server	Portal Service	TCP/HTTPS	443	Inbound	Accept
Advanced Remote Management server	MS SQL Database Server	TCP	1433	Inbound	Accept

Domain Name Service

Domain Name Service is required only for multiple server installations. Domain Name Service is not required on single server installations (App+Core+Portal+CP).

In multi-server installations, the ARM server requires a forward lookup zone and three DNS records within the forward lookup zone. These records enable devices to communicate properly with the components within the ARM server. The forward lookup zone, the host record, and service records all must point to the ARM server.

Requirement	Description
Forward Lookup Zone	<p>Create a forward lookup zone that points to your ARM server.</p> <p>The forward lookup zone must be named.</p> <pre>controlplane.aetherpal.internal</pre>

Requirement	Description
Host (A) Record	<p>The Host (A) Record must be named the following.</p> <pre>admin</pre> <ul style="list-style-type: none"> If the ARM Server is behind a load balancer, then the Host (A) Record must point to the internal IP address of the VIP (also known as Virtual IP) for the load balanced pool. If the ARM server is not behind a load balancer, then the Host (A) Record must point to the ARM Server IP address.
Service Coordinator Service Records	<ul style="list-style-type: none"> Record type: SRV. Domain: controlplane.aetherpal.internal Service: _svc. Protocol: _tcp. Priority: 0 Weight: 0 Port number: 8870 Host Offering this service: admin.controlplane.aetherpal.internal
Data Tier Proxy Service Record	<ul style="list-style-type: none"> Record type: SRV. Domain: controlplane.aetherpal.internal Service: _dtp. Protocol: _tcp. Priority: 0. Weight: 0. Port number: 8865. Host Offering this service: admin.controlplane.aetherpal.internal

Upgrade to a New Version

Upgrading to a new version of Advanced Remote Management (ARM) is simple. Take the following steps to install a new version of ARM on top of an existing, older version.

- To ensure that you do not run the old installer file in error, replace the previous version of the installer with the new version in the same folder. All certificates and the install.config file remain the same.
- Run the new installer. The installer prompts you to remove the currently installed components, excluding the database.
- Agree to allow the installer to remove the installed components. Once complete, the installer prompts you to install new versions of the same components. Agree to this and let the installer run its course.

Chapter 2:

Load Balancer

A load balancer improves the workload distribution across multiple server resources and is valuable in high capacity, high availability environments.

Integrate a Load Balancer to Your Deployment

You can integrate a load balancer into a new Advanced Remote Management (ARM) configuration, provided you have implemented all the multi-node options during server and database installation.

1. When you initially run the installer which creates the config.installer file, you are presented with the **Database Credentials** screen. For multi-node solutions, you must enter the database server instance *name* or the database server instance *IP address*.
See **Step 5** in [Configure the Advanced Remote Management Installer on page 21](#).
2. Ensure that you delete the Default Website from IIS once the server is running.
See **Step 8** in [Configure the Advanced Remote Management Installer on page 21](#).
3. You must run the database installation by itself even if you are installing other services on the same server.
4. The ARM server requires a host record that points to the internal IP address of the VIP (also known as Virtual IP) for the load balanced pool.
See the **Domain Name Service** section of the [Advanced Remote Management Requirements on page 7](#).
5. Ensure that each [FQDN] record in the [ApAdmin].[dbo].[Server] table in the database points to the internal IP address of the VIP (also known as Virtual IP) for the load balanced pool.
See [Troubleshooting, Modify Database Record for Multi-Node Configuration on page 38](#).

Chapter 3:

Install Advanced Remote Management

Before you can benefit from remotely accessing devices in your fleet, you must install and configure the Advanced Remote Management server. There are two methods to installing ARM.

- **Standard**, for installations that require only the default settings.
- **Custom**, for installations with advanced options such as multiple servers to accommodate high availability and horizontal scaling.

Standard Installation of Advanced Remote Management

The standard method of installing the Advanced Remote Management (ARM) server is a process that is comprised of a single phase. Take the following steps to install ARM with its standard configuration.

1. Download, extract, and save the Advanced Remote Management installer into a temporary directory on the ARM server and run the installer as administrator.
2. At the Welcome screen, select **Next**.
3. Enter the directory where you would like to install the Advanced Remote Management application to be installed and select **Install**. The default installation directory can be customized to any location on the server.
4. Select Standard Installation (Basic) and then select **Next**.
5. If SQL Server is already installed on the server or on another server where RM databases will be deployed, select 'Connect to existing SQL Server' and enter the required parameters.
 - **SQL server name:** define the SQL Server instance running on the server (i.e. \\SQLEXPRESS', (local), etc.).
 - **Authentication:** select either Windows authentication to authenticate to SQL Server as current Windows user OR select SQL Server Authentication to select a SQL server account, such as SA.
 - **Username:** if SQL Server Authentication was used, type in the username that is used to authenticate against the SQL server.
 - **Password:** type in the password for the username selected.

Select the **...More** button to enter additional details.

- The installer creates two user accounts to access and maintain ARM SQL databases. They are *apadminuser* and *apdbuser*.

Specify passwords for these accounts.

Enter in the path for database MDF, LDF, and NDF files.

Select **Save** to proceed.

You are taken back to previous screen. Select **Next** to proceed.

- In the **Tenant FQDN** field, type in the FQDN for portal (web) services.

In the SSL certificate field, select the folder button or the pull-down arrow to select the SSL certificate for the ARM system that should correspond to the FQDN.

The certificate should have been installed in the local system personal certificate store.

Select the certificate and then select **OK**.

- Deselect the **Apply Default Settings** check box and select the folder icon to attach the T10 certificate.

Browse for the T10 certificate, select the certificate, and then select **Open**.

- Select the **...More** button to select additional settings for the ARM system. Verify the parameters.

Portal Service Settings

- HTTP Port:** Defines the internal HTTP port used by portal services. By default, port 80 is selected. You can use a different port if port 80 is being used, such as 8080.
- IIS Site Binding IP address:** Defines from which interfaces/IP addresses portal services may be reached. By default, the setting is 'All Unassigned' to enable all interfaces/IPs.
- HTTPS port:** Defines the HTTPS port used by portal services for outside access. By default, port 443 is selected. You may use a different port, such as 7443 if 443 is already used.
- SSL Enable:** Enables SSL/TLS protocol for portal services. By default, this checkbox is checked so that the portal services utilize SSL/TLS. Leave this checkbox checked.
- T10 Username and Auto Generated:** Defines T10 API user for connectivity between AirWatch portal and RM system. By default, if 'Auto Generated' checkbox is checked, the installer assigns a random username to be created locally on the server. Leave this field default and the checkbox checked for the Installer to create the T10 API user. If you would like to define the user, uncheck the box and type in the T10 username you would like to use.

Connection Proctor Settings

- CP FQDN/Port:** Defines the FQDN and port on which CP services may be reached. Enter in the FQDN, which should be the same as the FQDN assigned for portal services. Enter port 8443, which is the default port for CP services. If port 8443 may not be used, you may enter any other port. Be sure that network/security teams will use this assigned port when assigning translation rules from the firewall/router to the RM Server for CP services.

SAS Service Settings

- Internal service username/password:** Defines the username to be used for System Admin Service. BY default, username and password are both set to 'root'.

Select **Save** to continue. You are taken to previous screen.

Select **Next** to continue. The installer performs multiple pre-requisite checks to ensure the product can be installed.

- After the installer performs the prerequisites check, a summary report displays. If the initial prerequisite check comes back with all components passing, select **Install** and proceed to step 12. Do NOT select Install if any of the components fail.

If any of the prerequisites are missing, the check fails. Select **Detailed Report** link to see which prerequisites are missing.

To install missing prerequisite components, select the **Install Components** link. The installer installs the missing components. You may need to reboot the server after the prerequisites are installed.

- Once the **Install** button is selected, the installation process begins.
Note: Database execution might take an extended period of time.
- When the installation completes, select **Next** to continue.
- You are prompted to run the Resource Pack that loads all available device profiles onto the ARM system. Leave the **Execute Resource pack** check box checked and select the **Finish** button.
- By default, the Resource Pack utility imports all device profiles by using a command line window. After Resource Pack utility completes, the command line window closes.

Custom Installation of Advanced Remote Management

On-premises customers must run the Advanced Remote Management (ARM) installer on a server. SaaS customers do not need to install an ARM server. There are four major steps to installing Advanced Remote Management.

- The **Generate ARM Certificates** step creates the root and intermediate certificate chain needed by the installer.
- The **Install SSL Certificate** step secures HTTPS binding to the management website port and allows for a secure connection.
- The **Configure ARM Installer** step creates an install.config file which contains the configuration settings for the different components of the Advanced Remote Management server.
- The **Install ARM Server Components** step uses that install.config file to install the components onto the server.

Generate the Advanced Remote Management Certificates

As part of deploying the Advanced Remote Management (ARM) server, generate the root and intermediate certificates used during installation.

- Download the installer package, titled **VMware Workspace ONE™ UEM Remote Management Installer**, from my Workspace ONE.
- Extract all contents from the installer package ZIP file into c:\temp of the ARM server. Do not move the files around inside the temp folder as the installer needs all the files in their extracted locations. Do not rename or move the temp folder.
- Run the Remote Management Certificate Generator which is included in the installer package.

- Be certain to use the correct version of the tool according to the version of Workspace ONE UEM you are using.

Workspace ONE UEM Version	Certificate Generator Tool Version
Pre 9.2	RemoteManagementCertificateGenerator_Before_9_2
9.2 and after	RemoteManagementCertificateGenerator_9_2

- This tool must be run on a machine with the same locale settings as the database server to ensure that the same date format is set in the SQL script.
 - You must run this certificate generator as an administrator.
4. In the UEM console, switch to your primary organization group (OG).
 - The OG you select must be of a 'customer' type. For more information about organization groups, see Organization Group Type Functions from the **VMware Workspace ONE UEM Mobile Device Management Guide**.
 5. Navigate to **Groups & Settings > All Settings > System > Advanced > Site URLs**, scroll down to the **External Remote Management** section, and copy the string in the **Remote Management CN** text box.
 - If the **Remote Management CN** text box is blank, then you must manually [Create the Remote Management CN from the Workspace ONE UEM Database on page 39](#).
 6. Set the following values.

Setting	Value
Certificate Type	Remote Management
Deployment	On-prem
Certificate Common Name	Paste the Remote Management CN copied from step 5 preceding.

7. Select **Generate Certificates**.
8. Set **Password** for the certificates when prompted. Store this password for future use.
9. Navigate to the folder holding the Remote Management Certificate Generator.
 - a. Find the generated certificates file in the Artifacts\private folder called root_intermediate_chain.p7b.
 - b. Copy this file to the c:\temp\certs folder on the Advanced Remote Management Server. This file is the T10 Certificate which is needed later.
 - The T10 interface certificate contains two major certificates that enable Workspace ONE UEM to communicate with the T10 portal. These certs are the Workspace ONE UEM portal Root and Intermediate certificates in a p7b file.
10. In the Artifacts folder, find the "Certificate Seed Script.sql". Run this script against the Workspace ONE UEM Database to seed the generated certificates into the Workspace ONE UEM database.
 - If you receive the error message "The conversion of a varchar data type to a datetime data type resulted in an out-of-range value," then see [Troubleshooting, Generate Certificates on page 35](#).

Next, proceed to Configure the Advanced Remote Management Installer.

Support for multiple Workspace ONE UEM environments is available. For details, see [Multi-Workspace ONE UEM Environment Support on page 40](#).

Install an SSL Certificate

You can incorporate a secure sockets layer (SSL) certificate into the Advanced Remote Management process. SSL certificates provide secure, encrypted communications between a website and an internet browser.

The SSL certificate secures HTTPS binding for the management website for port 443 and allows a secure connection. This secure connection is between the admin and Web services. Also, the SSL certificate secures the connection to the Connection Proctor on port 8443. You must provide the SSL certificate as a wildcard or SAN certificate.

This process applies only to the SSL certificate not the root and intermediate chain.

1. Run the Microsoft Management Console (MMC). Locate this app by typing 'mmc' into the search box found in the Start button.
2. In the **File** menu of the MMC app, select **Add/Remove Snap-in....** the **Add or Remove Snap-ins** dialog displays.
3. Under **Available snap-ins** on the left panel, select **Certificates** and then select the **Add** button in the middle. The **Certificates snap-in** dialog displays.
4. Select **Computer Account** and then select the **Next** button.
5. Select **Local Computer** and then select the **Finish** button. Now the **Add or Remove Snap-ins** dialog displays **Certificates (Local Computer)** under the **Console Root** on the right panel.
6. Select **OK** to finish and the main MMC window displays.
7. Expand the **Certificates (Local Computer)** on the left panel by selecting the > symbol. Now select **Personal > Certificates**.
8. In the **Action** menu of the MMC app, select **All Tasks** followed by **Import....** The **Certificate Import Wizard** displays.
9. Select **Next** to begin the Wizard.
10. Select **Browse...** to locate the SSL certificate in the PFX file format. Once located, select **Open** to import it.
11. Enter the certificate's **Password** when prompted. Add check marks to the two boxes labeled **Mark this key as exportable** and **Include all extended properties**.
12. Select **Next**.
13. Select **Place all certificates in the following store** and set the **Certificate** store to 'Personal'.
14. Select **Next**.
15. Confirm all the presented information is correct and then select **Finish**.

Configure the Advanced Remote Management Installer

The Advanced Remote Management (ARM) installer requires configuring the settings before starting installation. This process entails the creation of a config file that the installer requires. You can use this config file to install multiple servers.

1. Start the Advanced Remote Management installer from the c:\temp folder on the RM server.
2. Select **Next**.

3. Select **Configure** to configure the server settings before installation.

4. Enter the **Database Credentials**.

Setting	Description
Database Server Name	<ul style="list-style-type: none"> For a single-server solution, enter the server hostname, IP address, or loopback address. For a multi-node solution, enter the database server instance name or the database server instance IP address.
DB Owner user name	Enter the user name of the internal ARM Database user that the installation creates in the database.
DB Application user name	Enter the user name of the internal ARM Database user that the installation automatically creates in the database.

5. (Optional) Select the **Advanced** button to configure the Port, LDF, MDF, and NDF paths for the database. Ensure that your Windows account has full access to these folders.

6. Select **Next**.

7. Configure the **Portal Information** settings.

Setting	Description
Websaver	
IP Address	Enter the IP address for the webservice.
Port	<p>Enter the port. The default is 80.</p> <p>Select check to validate the port.</p> <ul style="list-style-type: none"> If the port is used by a web service, the installer displays Port in use in red. If the port is not use by any web service, the installer displays Valid! in green. <p>If your IIS Default Website is bound to port 80, then you must either delete the Default Website or use a different port. The suggested replacement is port 8080.</p>
Enable HTTPS Binding	This setting is required. The port defaults to 443.

Setting	Description
Enrollment Certificate	
Enrollment Certificate	<p>Select the ... Button to browse for the EnrollmentCertificate.pfx file, which can be found in the installer package in the c:\temp folder.</p> <p>When you select the certificate, the installer asks for the certificate password which is also included in the installer package in the Password.txt file.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note: The enrollment certificate is an SSL certificate that enables remote management devices to enroll or register with the ARM server. The enrollment certificate also secures the connection to the server.</p> </div>

Select **Next**.

- Configure the **Application Service Information** settings.

Setting	Description
Enable T10 Service	Select to enable the T10 service.
T10 Certificate	Select the ... button, navigate to the c:\temp\certs folder, and select root_intermediate_chain.p7b.
Auto generate a user in Local Users and Groups	<p>Enable this option to generate a T10 user.</p> <p>If you manually generate a T10 user, you must enter the user name in the provided text box.</p>

- Select **Finish**.

After selecting Finish, the installer creates the install.config file. This file contains all the configuration settings for the ARM installer. When installing on multiple ARM servers, you must follow this task only once, then export the resulting config file to the other servers.

Next, proceed to Install the Advanced Remote Management Server Components.

Install the Advanced Remote Management Server Components

After running the Configure portion of the Advanced Remote Management (ARM) installer, run the Install portion to install the components.

- Select **Install** to install the server components after the configuration has completed.
- Select all components to install on the server.
 - Database
 - The database component is installed remotely based on the hostname and credentials previously configured in **Step 5** of the [Configure the ARM Installer](#) task.
 - Core Services
 - Portal Services

- Application Services
- Connection Proctor

3. Select **Next**.

4. Configure the **Database Credentials** settings.

Setting	Description
SQL Database	
Server Name	Enter the Database server hostname.
Authentication	Select the database account authentication. The authentication can be either Windows Authentication or SQL Authentication .
User name	Enter the user name of the database account. This user name is used by the installer to create all the databases required to install Remote Management.
Password	Enter the password of the database account.
Application Access	
Database Owner Password	Set the password for the ARM database owner SQL account. This account does not have system-wide permissions. The account only has permissions within the ARM databases.
Database User Password	Set the password for the ARM database user SQL account. This account does not have system-wide permissions. The account only has permissions within the ARM databases.

5. Select **Next**.

6. Configure the **Authentication Credentials** settings.

Setting	Description
Enrollment Certificate Details	
Enrollment Certificate Password	Enter the password for the enrollment certificate added during the Configuration portion.

7. Select **Next**.

8. Configure the **Portal Credentials** settings.

Setting	Description
SSL Certificate	<p>Select the ... button to browse for the SSL Certificate installed before starting the Configuration portion.</p> <p>SAN (subject alternative name) certificates are supported. The implementation of SAN certificates depends upon your server arrangement.</p> <ul style="list-style-type: none"> • Single Node – The SAN certificate must define the FQDN for each public facing server/SSL termination point that hosts the solution. • Multi-Node – The SAN certificate must have an FQDN defined for each connection proctor server and advanced remote management server. <ul style="list-style-type: none"> ◦ For example, presume you have 2 connection proctor servers and 2 advanced remote management servers. The 2 ARM servers host portal services, which need TLS/SSL traffic terminated at the load balancer. The FQDN for the SAN certificate must reflect the fully qualified domain name, for instance, "rmstage01.awmdm.com". ◦ Meanwhile, for each of the 2 CP servers, TLS/SSL traffic terminates at the connection proctor, and therefore, you must have 2 FQDNs defined in the SAN certificate, for instance, "rmstage01.awmdm.com" and "rmstage02.awmdm.com".

9. Select **Next**.
10. Configure the **Connection Proctor Credentials** settings.

Setting	Description
CP Binding (Local)	This setting is auto-populated.
Port	This setting is a verification which you can use to check for port 8443.
CP FQDN	Enter the server fully qualified domain name. For example, "rmstage01.awmdm.com"
Port	Enter the actual port number used for the Connection Proctor component. Consider using 8443.
CP certificate	<p>Select the ... button to browse for the SSL Certificate installed before starting the Configuration portion.</p> <p>This certificate is the same one used on the Authentication Credentials screen in the previous step.</p>

11. If you are configuring a single server solution where the database is installed separately, you must deselect the "Controlplane.aetherpal.internal" check box in the more options (...) in the Connection Proctor screen. Skip this step if you are configuring a multi-server solution.
12. Select **Next**.
13. Select **OK** to confirm that you have opened the firewall ports.
14. Select **Next**. The **Execute Resource pack** check box option appears. Make sure that this checkbox has been enabled.
15. Select **Finish**. The resource pack is then imported automatically.

Next, proceed to Configure the Workspace ONE™ UEM console.

Configure the Workspace ONE UEM Console

After installing the Advanced Remote Management (ARM) server and all its components, configure the UEM console to communicate with the ARM server.

To configure the UEM console.

1. In the UEM console, ensure that you are in the Global OG.
2. Navigate to **Settings > System > Advanced > Site URLs > External Remote Management**.
3. Complete the ARM settings.

Settings	Description
Console Connection Hostname	Enter the ARM server fully qualified domain name (FQDN) plus "/t10". For example: <pre>https://rmstage01.awmdn.com/t10</pre>
Device Connection Name	Enter the ARM server fully qualified domain name (FQDN). For example: <pre>https://rmstage01.awmdn.com</pre>

4. Select **Save**.

The ARM server is now ready to handle remote management sessions with end-user devices. Next, proceed to Configure End User Devices.

Configure End-User Devices

Now that the servers have been installed and configured you must install the platform-specific agents on the devices so that they can be remotely managed.

1. Visit the my Workspace ONE™ page that lists all the device agents.
(<https://my.workspaceone.com/products/AirWatch-Agent>).
2. Identify and download platform-specific Remote Management agents that are applicable to your deployment.
3. You can push these apps to devices as an internal app through the App Management function in Workspace ONE UEM or you can utilize Product Provisioning.

For more information about App Management, see the **VMware AirWatch Mobile Application Management Guide**.

For more information about Product Provisioning, see the **VMware AirWatch Product Provisioning for Android**

Guide and **VMware AirWatch Product Provisioning for Windows Rugged Guide**.

All of these guides and more can be found on docs.vmware.com.

You are now ready to manage devices remotely. Next, proceed to Start an Advanced Remote Management Connection.

Start an Advanced Remote Management Connection

Connect to devices for troubleshooting and maintenance using the Advanced Remote Management (ARM) connection tool. This tool starts a remote management session and controls the connection to the remote device.

To start an ARM connection.

1. Navigate to **Devices > List View** and select the friendly name of the device you want to create a remote connection with. This page displays the **Details View** for the selected device.
2. Select the **More Actions** drop-down menu and select **Remote Management**.
3. In the Remote Support window, select **Launch Session** after the connection process completes.
4. The console displays a four-digit PIN which you must direct the customer to enter into their device. This action provides customer authorization to manage their device remotely.
Once the connection is made, the remote management client opens and the device is ready for use.
5. There are three supported remote client tools at your disposal.
 - a. **Display Capture** – View a remote device's screens, create shortcuts, and diagnose device issues.
 - b. **Manage Files** – Access the file system of the remote device.
 - c. **Command Line (Android Only)** – Send commands to the remote device using the Command Line Interface (CLI).

Chapter 4:

Advanced Remote Management Client Tools

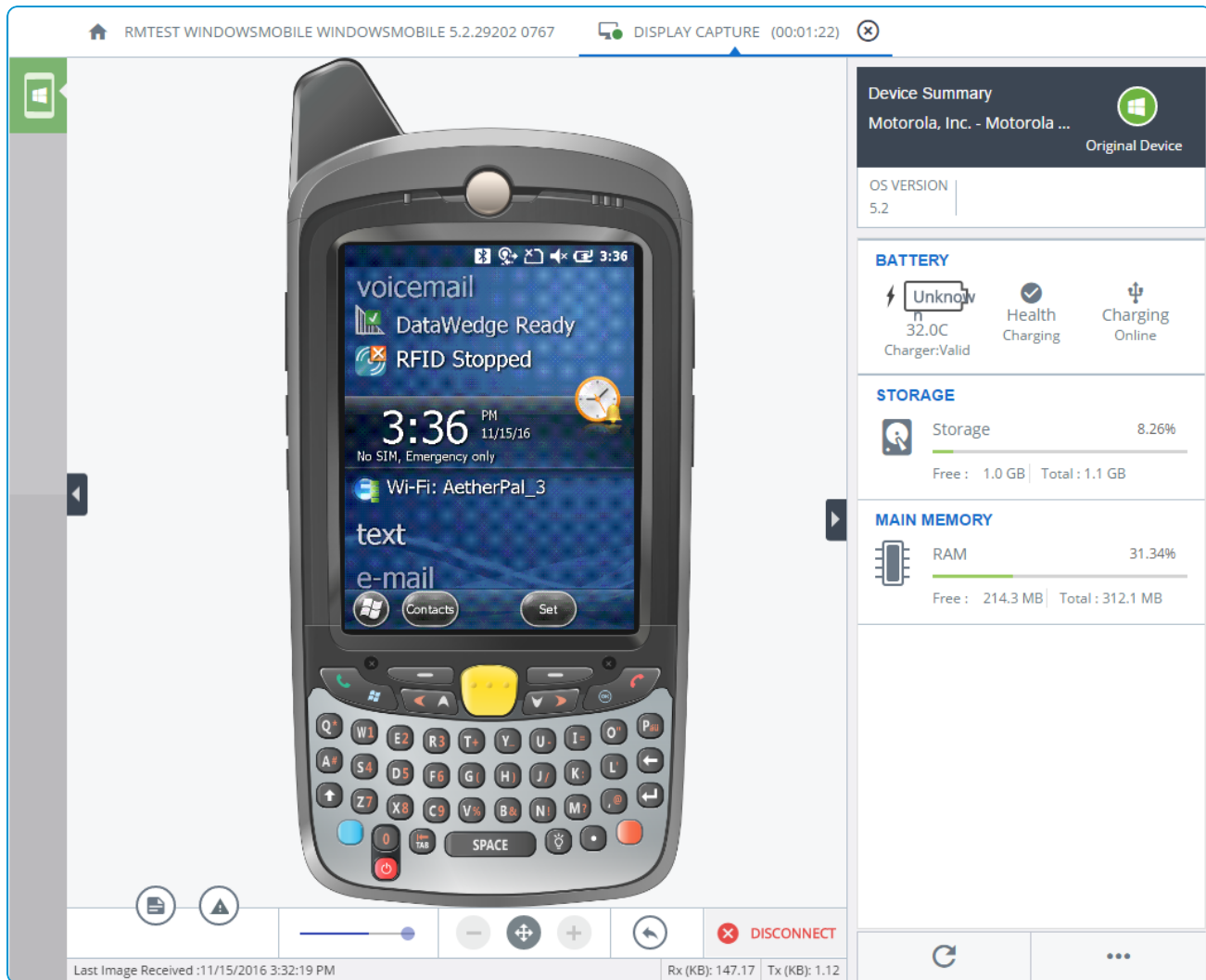
The Advanced Remote Management (ARM) client provides support tools to facilitate troubleshooting and remotely controlling end-user devices. The tools are located around the device view.

Advanced Remote Management does not have the same functionality as Remote Management v3.0. The following features are not currently available in ARM.

- Registry Manager
- Macros during the session.

Display Capture, Remote Control

The main section of the Advanced Remote Management (ARM) client is a device screen view that allows you to control the end-user device remotely.



Control the device by clicking or dragging on the displayed screen and buttons. You can send keystrokes to the device and copy and paste information onto the device during a session.

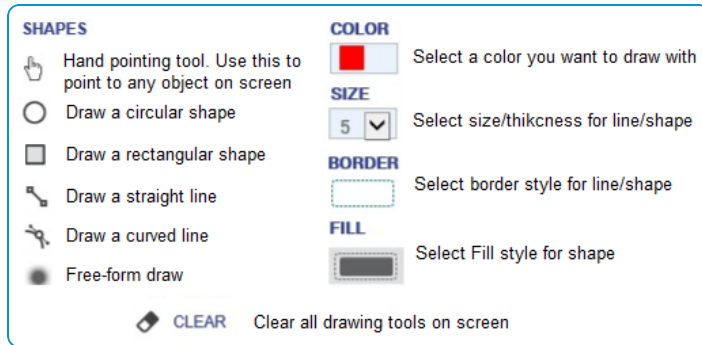
If a user needs privacy, they can pause a remote control session.

Device Whiteboard, Android Only

The device whiteboard functionality allows you to highlight a specific item to the user. The whiteboard allows you to draw, highlight, and point to areas on the screen.

To use the whiteboard, select the whiteboard icon (🖍️) in the bottom right of the device screen view.

The whiteboard menu consists of the following items.



Shortcuts

The ARM client provides a shortcuts menu to navigate quickly to a screen or menu item on the device. The shortcuts icon is on the bottom right, near the whiteboard icon.

Device Summary

The ARM client provides a device summary of information similar to Device Details. Use this information to diagnose issues on a device while connected without navigating away from the ARM client.

The Device Summary pane provides at-a-glance information to use during troubleshooting. The pane displays signal strength, battery, network status, storage, and main memory information. Display additional information not displayed in the information by selecting the Additional Information (***) icon.

Detailed Device Information

The Additional Information screen provides detailed information on the device, applications, processes, and remote control history.

Select each information list from the left navigation bar.

The Device information displays Device make and model, battery details, storage, connection, RAM, and more. Minimize the pane and manage which panes are visible by clicking each device details section header. You can also search for specific information with the search bar in the top right corner.

The application list provides a list of applications installed on the device and application details such as the version number and package name. You can stop any running app from this list.

The process list displays the current processes running on the device and detailed information. You can kill any running process from this list.

Manage Files

You can use the Manage Files client tool to upload files, download files, download folders, rename files, and delete files on the device.

Upload a File

You can upload a file to the device you are managing remotely.

1. In the active Advanced Remote Management (ARM) session and the Manage Files client tool activated, select the red, circular **Upload** button in the bottom-right corner of the screen.
2. Select the **Browse** button and select a file accessible to the Workspace ONE™ UEM console you want to add to the device's file system.
3. Select **Close** on the File Upload Completed confirmation.

Download a File

You can download a file from the device with the Manage Files client tool.

1. In the active ARM session and the Manage Files client tool activated, locate the file on the device you want to download. You can find the "breadcrumbs" style folder path at the top of the file listing a useful navigation aid.
2. Select the **Download** button (📄).
3. Downloaded files are saved according to your default browser's downloaded file action.

Rename a File

You can rename a file on the remote device using the Manage Files client tool.

1. In the active ARM session and the Manage Files client tool activated, locate the file on the device you want to rename.
2. Select the **Rename** button. This button is located in the button cluster to the left of the **Size** column. The Rename screen displays where you can enter the new name for the file.
3. Select **OK** to save your changes.

Select Multiple Files

You can select multiple files on the remote device using the Manage Files client tool. Multi-selecting files can be useful if you want to cut, copy (followed by paste), or delete them.

1. In the active ARM session and the Manage Files Client tool activated, locate the files you want to select.
2. Click the check box to the left of each file you want to select.

Download a Folder

You can download an entire folder from the remote device including the folder's contents.

1. In the active ARM session and the Manage Files client tool activated, locate the folder on the device you want to download. You might find the "breadcrumbs" style folder path at the top of the file listing a useful navigation aid.
2. Select the **Download** button (📄).
3. The downloaded folder and all its content is saved according to your default browser's download action.
For example, if you select a folder to download called "remoteDocs" and your default browser's download action is to save all downloads to "C:\Documents\downloads" then once the download successfully completes, you can expect to find the folder's content in C:\Documents\downloads\remoteDocs.

Cut, Copy, and Paste a File

You can cut, copy, and paste files on the remote device using the Manage Files client tool.

1. Once you have selected the files you want, select the **Cut** button (✂) or **Copy** button (📄). Cutting files removes the files from the source location while copying files leaves the files in the source location.
2. Navigate to the target location on the device.
3. Select the **Paste** button, which only becomes visible when either the Cut or Copy buttons have been selected.

Delete a File

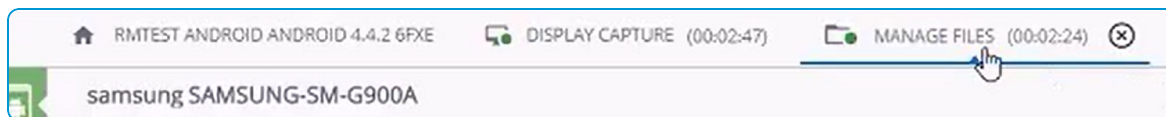
You can also delete a file from the remote device.

1. In the active ARM session and the Manage Files client tool activated, locate the file on the device you want to delete.
2. Select the **Delete** button (🗑).
3. Select **OK** to confirm file deletion.

Close the Manage File Session

When you are finished managing files remotely, you can close the Manage Files session while keeping the Display Capture session running.

1. In the active Remote Management session, locate the header bar toward the top of the browser.



2. Select the circled **X** button to the right of the Manage Files indicator.
3. Select **OK** to confirm closure of the Manage Files session.

Command-Line Interface

The Command-Line Interface (CLI) is the counterpoint to the Graphical User Interface (GUI). While graphical user interfaces make common tasks easy, command-line interfaces make difficult tasks possible.

This list applies to Android only.

CLI Commands	Support Level	Function
am get-config	Full	Gather configuration data from a device.
cd	Full	Change directory.
getprop	Full	Get properties via the android property service.
getprop ro.build.version.sdk	Full	Get API level device properties.
ip -f inet addr show wlan0	Full	Show WiFi IP address.
logcat	Full	Prints log data to the screen.
logcat *:D	Partial	Prints log data to the screen, filter to show only the debug level. In a few devices, this command cannot be canceled.
logcat *:E	Partial	Prints log data to the screen, filter to show only the error level. In a few devices, this command cannot be canceled.
logcat *:I	Partial	Prints log data to the screen, filter to show only the info level. In a few devices, this command cannot be canceled.
logcat *:V	Partial	Prints log data to the screen, filter to show only the verbose level. In a few devices, this command cannot be canceled.
logcat *:W	Partial	Prints log data to the screen, filter to show only the warning level. In a few devices, this command cannot be canceled.
ls	Full	List the directory contents.
ls -a	Full	List the directory contents, do not hide entries starting with a dot.
ls -n	Full	List the directory contents, list numeric UIDs, and GIDs.
ls -R	Full	List the directory contents, list subdirectories recursively.
ls -s	Full	List the directory contents, print size of each file, in blocks.
mkdir	Full	Make directory.
netcfg / ifconfig	Full	Configure and manage network connections via profiles.
netstat	Full	Network statistics.
ping	Partial	Test the connection and latency between two network connection. In few devices, this command cannot be canceled.

CLI Commands	Support Level	Function
pm list packages	Full	Prints all packages, optionally only those whose package name contains the text in <FILTER>.
pm list packages -3	Full	Prints all packages filtered to show only the third-party packages.
pm list packages -d	Full	Prints all packages filtered to show only the disabled packages.
pm list packages -e	Full	Prints all packages filtered to show only the enabled packages.
pm list packages -f	Full	Prints all packages including their associated file.
pm list packages -i	Full	See the installer for the packages.
pm list packages -s	Full	Prints all packages filtered to show only the system packages.
pm list packages -u	Full	Prints all packages including uninstalled packages.
pm list permission-groups	Full	Lists all permissions groups.
pm list permissions	Full	Lists all permissions on the device.
pm path <package>	Full	Print the path to the APK of the given <package>.
ps	Full	Print process status.
ps -p	Full	Print process status and show scheduling policy.
pwd	Full	Print the current working directory location.
rm -d	Full	Remove a directory, even if it is not empty.
rm -f	Full	Remove a directory, force remove without prompt.
rm -r	Full	Remove the contents of the directory recursively.
top	Partial	Display top CPU processes. In a few devices, this command cannot be canceled.
touch	Full	Create an empty file or change file timestamps.

Chapter 5:

Troubleshooting Advanced Remote Management

If you are having issues with your Advanced Remote Management performance or service, consider troubleshooting your issue before calling support. These troubleshooting steps address the most common issues with the ARM service.

Troubleshooting, Generate Certificates

While running the "Certificate Seed Script.sql" file in **Step 10** of the Generate Advanced Remote Management Certificates task, you might see an error. This error reads *The conversion of a varchar data type to a datetime data type resulted in an out-of-range value.*

Such an error is likely the result of a difference in locale between the machine upon which the SQL script was generated and the database server on which it is being run.

There are two possible solutions.

- Run the cert provisioning tool on a machine with the same locale settings as the database server to ensure that the same date format is set in the SQL script.

OR (if the first solution is not possible)

- Manually edit the date format in the SQL script to avoid errors while deploying the script during installation.

For more information about date formats, see <http://www.sql-server-helper.com/tips/date-formats.aspx>.

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Troubleshooting, Remote Management Not Available - Device Registration Issues

Advanced Remote Management Link Does Not Display in Workspace ONE™ UEM

Problem

ARM link does not display in the More Actions drop-down menu as seen in Device Details View OR device is not shown in the Device List View.

Possible Cause

Registration failed or ARM agent might not have been deployed properly. ARM Agent might have not been installed on the device properly or registration to ARM Server has failed.

Solution

Attempt to re-register the device. Update Resource portal to ensure that ARM agent may be properly downloaded and installed on device. A Workspace ONE UEM administrator must re-register the device.

Registration Check Returns Failed

Problem

Device does not register with Workspace ONE UEM or the ARM portal.

Possible cause

P7b file missing root/intermediate certificates in certificate chain. In MMC (Microsoft Management Console) certificate console when opening the certificate, the certificate path is missing and certificate status displays: the issue of this certificate could not be found.

Solution

Reinstall the certificate including intermediate and root certificate. Reinstall all the certificates for this client and ensure that the root certificate is placed into the root certificate folder and the intermediate certificate is placed in intermediate certificate folders in MMC certificate console.

Error Message, 'Registration Failed: Server Not Found'

Problem

Device does not register with Workspace ONE UEM or the ARM portal.

Possible cause

ARM Site URL capital and lower-case letters. In Advanced Remote Management tool versions 4.4.2.6291 and prior, the URL for remote management server is CAPS sensitive. In the example shown below, the URL utilizes upper-case and lower-case letters 'https://rmSTAGE01.awmdm.com'

Solution

Remove upper case characters from the Advanced Remote Management site URL. Check the ARM site configuration. You need to ensure that the URL has all lower-case letters. In the example above, the URL should be 'https://rmstage01.awmdm.com'.

Possible cause

Firewall is ON but misconfigured. If the firewall is incorrectly configured on the Advanced Remote Management Server, it might be preventing device registrations from being received.

Solution

Turn off firewall or set up exceptions. When the firewall is on and it is not correctly configured, it might be preventing device registrations. Devices register with the Anchor web service, usually hosted on port 443 on the ARM server. If this port is blocked on the firewall, registrations are jeopardized. Turn off the firewall and see if registrations succeed. If they do, check the exceptions to ensure that the Anchor web service on port 443 or other port defined for this service is in the list of exceptions.

Troubleshooting, Issues Connecting to Devices

If you are having issues with your Advanced Remote Management performance or service, consider troubleshooting your issue before calling support. These troubleshooting steps address the most common issues with the ARM service.

Browser Window Does Not Open Remote Management Portal

Problem

The Advanced Remote Management (ARM) portal is not opening on Workspace ONE™ UEM users' browser window.

Possible Cause

Incompatible web browser. The browser being used by VMware Support staff is not compatible with ARM.

Solution

Use a different web browser. Install or switch to a compatible browser. The following is a list of browsers currently supported by the Remote Management Tool.

- Internet Explorer 11 or later.
- Google Chrome.
- Safari.

Possible Cause

Browser pop ups are blocked. The browser being used is blocking pop-up windows from the ARM portal.

Solution

Enable pop-ups in browser settings. UEM console users must update their browser settings to allow pop-ups from the ARM portal.

Remote Support Validation Fails

Problem

During ARM validation steps, one or all the three validation steps and 'Launch Session' button does not appear.

Possible Cause(s): Certificate mismatch, ARM server issues. Client/Server certificates might be incorrectly deployed or there might be issues with availability of ARM server and console.

Solution: Check certificates and ensure ARM servers are operational. Ensure that T10 interface certificate has been properly deployed on the ARM servers, ensure that ARM servers are online and operational.

Troubleshooting, Modify Database Record for Multi-Node Configuration

In order for the Advanced Remote Management server to operate correctly in a multi-node configuration, you might need to modify DB records in [ApAdmin].[dbo].[Server].[FQDN]. Some installations result in these tables pointing to the external Virtual IP (VIP) address by default. This default arrangement must be changed.

Ensure that each [FQDN] record in the [ApAdmin].[dbo].[Server] table in the database points to the internal IP address of the VIP (also known as Virtual IP) for the load balanced pool.

The number of [FQDN] records is equal to the number of application/connection proctor servers in your deployment. Therefore, you must update each one in the table. For example, if your deployment has four connection proctor servers, then you must locate and modify 4 [FQDN] records in the [ApAdmin].[dbo].[Server] table.

After you complete the record modification, restart all ARM Servers.

Create the Remote Management CN from the Workspace ONE UEM Database

If the **Remote Management CN** text box is empty from Step 5 of Generate Advanced Remote Management Certificates, you can run an SQL script against the Workspace ONE™ UEM Database to create the Remote Management CN. Use the generated CN to create the root and intermediate certificates for Advanced Remote Management (ARM).

1. Open the Remote Management Certificate Generator. You must run this generator as an administrator.
2. Select the Question Mark button.
3. Copy the displayed text. This text is the SQL script to run against the Workspace ONE UEM Database.
4. Switch to the Workspace ONE UEM Database server and open SQL Server Management Studio.
5. Create a query with the copied text.
6. On the first line of the query, replace the **NULL** value with the GroupID for the customer type OG that you want to use. The OG you select must be a **customer** type, it cannot be of any other type including global, partner, container, and so on.

For example,

```
DECLARE @GroupID NVARCHAR(20) = NULL;
```

becomes

```
DECLARE @GroupID NVARCHAR(20) = 'RemoteManagement';
```

7. In the Results, copy the created Remote Management CN.

The Remote Management CN is used to generate the root and intermediate certificates for Remote Management. Proceed to **Step 6** of [Generate the Advanced Remote Management Certificates on page 19](#).

Multi-Workspace ONE UEM Environment Support

If you want to operate the Advanced Remote Management server across multiple Workspace ONE™ UEM environments, then take the following steps. This procedure assumes that you have already completed all the steps in [Generate the Advanced Remote Management Certificates on page 19](#).

Do not follow this procedure if you want ARM to work with a single Workspace ONE UEM environment.

1. Log in to the **secondary or other** Workspace ONE UEM environment. Do not log in to the same Workspace ONE UEM environment from **Step 4** in the task linked above.
2. In the UEM console, switch to your primary OG.
 - The OG you select must be of a 'customer' type. For more information about organization groups, see Organization Group Type Functions from the **VMware Workspace ONE UEM Mobile Device Management Guide**.
3. Navigate to **Groups & Settings > All Settings > System > Advanced > Site URLs**, scroll down to the **External Remote Management** section, and copy the string in the **Remote Management CN** text box. If this text box is blank, then you must manually [Create the Remote Management CN from the Workspace ONE UEM Database on page 39](#).
4. Switch back to the ARM server. Run the Remote Management Certificate Generator, which includes the Remote Management Installer, using the following values.

Setting	Value
Certificate Type	Remote Management
Deployment	Upload Intermediate
Certificate Common Name	Paste the Remote Management CN from Step 3 preceding.

5. Select **Generate Certificates** button.
6. When prompted, you must select the intermediate private cert. This certificate and password is the same one you originally generated in **Step 8** of [Generate the Advanced Remote Management Certificates on page 19](#). This certificate is located in c:\temp\certs of the ARM server.
7. In the ARM server, locate the 'artifacts' folder and run the SQL script file "Certificate Seed Script.sql" against the Workspace ONE UEM Database to seed the generated certificates into the Workspace ONE UEM database.
8. Repeat this entire step for each additional Workspace ONE UEM environment you want ARM to work with. For example, if you want to add two additional Workspace ONE UEM environments to the first environment you configured originally, then you must follow the steps of this task twice.
9. Once you have completed installing the client certificate for each Workspace ONE UEM environment, proceed to [Configure the Workspace ONE UEM Console on page 26](#).