

## 6. Updates

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TV firmware updates including Cast shell, shall be supported using the required agent defined as Qterics (formerly UpdateLogic Inc or ULI). Qterics is also the required agent for:

- Provisioning.

### 6.1 Software Updates for TV Firmware

SmartCast shall support 3 methods to updates TV firmware: Binary package update, UTV update and Internet update.

Software Update Methods	
1	<p>SOC binary package updates. After AC cycle with USB inserted, an update of the binary image proceeds. If compatible with SOC firmware and signature, this update is loaded by a low level loader. Even if everything from the kernel on up is broken, this firmware still loads. AC on version clears out all firmware leaving TV in a low level. On update completion, OOB is presented. This is a more comprehensive update that will be limited to VIZIO, ODMs, SoC provider, certain partners and support. Not for customers. USB package update is the only method to roll back firmware and is required to wipe certs and then TV must be re-registered.</p> <p>• Name the file with format <code>mgXXX-CommandStickName.cmd.Name</code></p>
2	<p>Qterics UTV updates. The USB includes the standard Qterics packaged format for the latest firmware update. The same as a firmware update delivered via OTA but loaded on USB. Firmware update only. The TV must be powered on and functional, and the Qterics Agent (client) active for this firmware to load.</p> <p>Obtain the UTV file by download using the "cloud" icon on 2020 NOC access page. Name the file with the format <code>mg302-updatename.utv</code> with "updatename" the part you can change (e.g. "mg302-1.1.6.1-5.utv"). NOTE: <code>updatelogic.txt</code> is no longer in use for 2020 and beyond.</p>
3	<p>Qterics Internet update. This is the Qterics Internet image. It contains the same core firmware as the UTV.</p>

#### 6.1.1 Software Update Requirements

SmartCast TV shall support 3 methods to updates TV firmware: Binary package update, UTV update and Internet update.

Requirement	
1	<p>SmartCast TV shall support 3 methods to updates TV firmware:</p> <ul style="list-style-type: none"><li>• Binary package update</li><li>• UTV update</li><li>• Internet update (OTA).</li></ul>
2	<p>In any of the 3 methods, the appropriate security requirements shall be implemented to satisfy the security requirements for an unauthorized upgrade or a bogus application.</p>
3	<p>The system shall support the ability to update the TV firmware through Qterics over IP.</p>
4	<p>All but the lowest level loader must be updateable, including the main SoC and programmable peripheral chips. This includes but is not limited to:</p> <ul style="list-style-type: none"><li>• Wi-Fi modules</li><li>• Bluetooth modules</li><li>• TCon/Gamma modules.</li></ul>
5	<p>After factory reset or at initial OOB, network connected, after OTA firmware update then SCPL DLM downloads assets and installs. SmartCast, binaries and TV is then completely up-to-date.</p>
6	<p>The TV shall contain multiple copies of the system software in order to recover a bad upgrade. Provisions must be made to account for any power interruption or loss or network connectivity during upgrade in the field or at the factory. In the event of a corrupt or bad upgrade see RECOVERY section.</p>

7	Platform shall implement and maintain ping pong partitions to store and execute previous firmware and current firmware that is being updated. In case of failure platform shall revert back to the previous firmware image to boot and retry. Also platform shall have a space for Golden build to revert to with minimum functions such as network and update when both ping/pong partitions fail.
8	<p>The TV is powered on during an update.</p> <ol style="list-style-type: none"> <li>1. After TV powered down the TV wakes up in the background (LED off) <b>about a minute after power off</b> to check for, and if found, download the update.</li> <li>2. TV powered on during update, then TV cannot be powered down to allow firmware install of the update.</li> <li>3. Check for updates, during firmware install, TV cannot be powered down to allow completion of the update.</li> </ol>

#### 6.1.1 Internet (OTA) Updates

	Internet (OTA) Updates Requirements
1	The Internet or over-the air (OTA) based update shall be implemented using the framework provided by Qterics UpdateTV.
2	UpdateTV requires a socket interface for the command and control communication with their Network Operating Center (NOC).
3	<p>Three ways to receive the OTA update:</p> <ol style="list-style-type: none"> <li>1. Check for update (update immediately, override all timers) <ol style="list-style-type: none"> <li>a. TV remains powered on but unavailable for viewing during the update process. Powering down during update should be avoided: kills the update.</li> </ol> </li> <li>2. Background Update: <ol style="list-style-type: none"> <li>a. 1 minute after TV powered off as per query pacing logic defined below. At launch checks daily at power down as per "Query Pacing Logic" below but as TV ages query increased to every 7 days.</li> </ol> </li> <li>3. Background Update: <ol style="list-style-type: none"> <li>a. If TV is not powered on then TV wakes up daily to check for update based on query pacing logic as per "Query Pacing Logic" below.</li> </ol> </li> </ol>
4	<p>Query Pacing Logic</p> <ul style="list-style-type: none"> <li>• Gated by query pacing logic at power down, after 1 minute or if powered down, 1 day, the board powers on, then the SMARTCAST UpdateTV client sends an inquiry to the NOC periodically asking if any updates are available.</li> </ul>
5	<p>If an update is available</p> <ul style="list-style-type: none"> <li>• TV client downloads the update.</li> <li>• TV installs the downloaded update.</li> </ul>
6	TV reboots to complete the install.
7	TV powers down again.
8	At the next power on, TV is running the new firmware and a notification of the update displays.
9	After the install is completed, wait 1 minute to check again for <b>DLM</b> binaries for the new install.
10	<p>If <b>DLM</b> binaries are available</p> <ul style="list-style-type: none"> <li>• Downloads the updated DLM binaries.</li> <li>• TV installs the downloaded DLM binaries.</li> </ul>
11	TV communicates to Qterics NOC via HTTPS but the UpdateTV client shall download the encrypted image via HTTP from VIZIO CDN, decrypt it, validate the decrypted image and provide it to the TV OS for installation.

#### 6.1.2 Upgradeable Modules from Firmware Update

The following software modules are upgradeable.

	Upgradeable Modules Requirements	Notes
1	Linux Kernel	
2	<b>VIZIO OS</b>	
3	System	

4	TV101 application and middleware	PQ and AQ updates
5	High Dynamic Range including Dolby Vision, HDR10 and HLG.	

## 6.2 SmartCast Platform Binary Package Updates Partner Apps

SmartCast platform servers shall provide the functionality to download and install binary packages. Currently this is limited to [Conjure](#), Cobalt and Airplay but expected to be extended to other apps.