

Technical Bulletin CS-19-01

# Versity Software Update Overview & Server Requirements

This technical bulletin explains the requirements for the software update server for the Spectralink Versity. Details about how the phone performs a software update, file selection criteria and software update trigger mechanisms.

## *System Affected*

Spectralink Versity smartphones

## *Software Update Server*

Spectralink Versity handsets support software updates to the device firmware via an external web server via HTTP or HTTPS connections. The web server selected must support the Directory Browsing and Look Ahead functions which are both available in most majorly available web server platforms.

## **Windows Server Recommendations**

For customers that are deploying their Versity handsets into a largely Windows based environment where they will have access to Windows Server systems, it will make the most sense to leverage a Windows Server platform for their web server. The Microsoft Windows Server IIS version 7 supports both Directory Browsing and Look Ahead functions which will allow you to use it to host software updates for your Versity handsets. Prior versions of Microsoft IIS also support these functions and may also work but your mileage may vary.



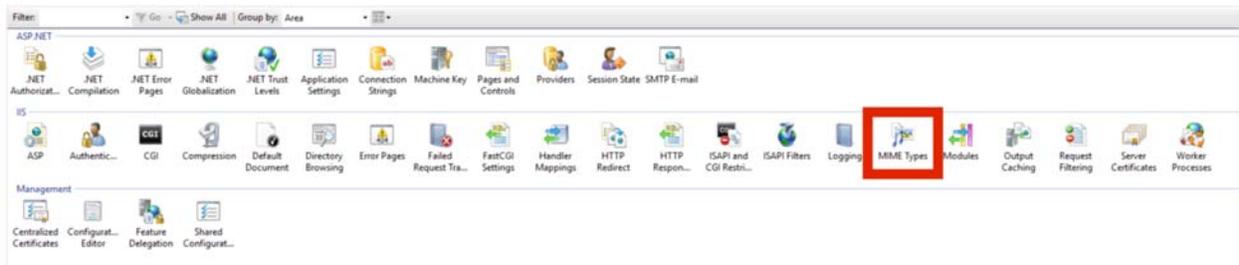
### **Note**

Be aware that you must enable Directory Browsing for the IIS site you are using for your software hosting as this feature is not enabled by default.

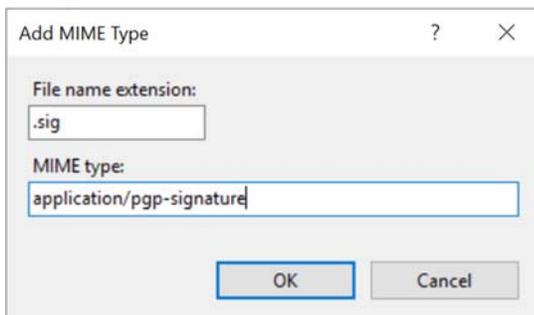
Once you've created a new site and specified the physical location to host the software files for your Versity handsets you can place the ZIP archive file and configure the SAM server settings

to allow the Verity handset to find the software. You can then trigger software updates from the SAM server, EMM/MDM platform or directly from the SAM client on the handset.

Windows IIS does require to the addition of some additional MIME types to support delivery of file times that are not normally offered by IIS. For example, starting with version 2.7, 1.7, of Verity software, the applications are delivered separately from the software package. The application bundle includes a signature file with a .sig file extension. This MIME type is not part of IIS and must be added to allow the application bundle to be delivered to handsets. Adding MIME types is very easy to do in IIS. You will just need to decide if you want to add MIME types at the global level or at the individual web site level. Start by opening the IIS Manager panel and navigating to the level you wish to add the MIME type. Click on the level and then in the right side, double click on the MIME Types.

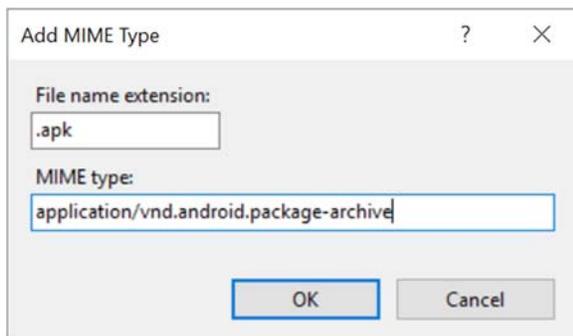


Now click the Add link in the Actions tab in the far right corner. In the frame that opens, enter the File name extension of .sig and in the MIME type box enter, application/pgp-signature. Then click the OK button to save it.



It's also necessary to add the MIME type .apk to support the delivery of the application files to handsets. In most cases, this won't be used, but there are several deployment scenarios where this is necessary for proper operation. To accommodate all scenarios, we recommend adding this MIME type to avoid future interruptions. Click the Add link again the in Actions tab in the far right corner. In the frame that opens, enter the File name extension of .apk

and in the MIME type box enter, application/vnd.android.package-archive. Then click the OK button to save it.



Finally, depending on the level that the MIME types were configured, you will need to restart the IIS server or the site the MIME types were added to. If you click on the top level server name, you will see in the Action pane on the right side of the screen the option to Restart the server. If you click on the site, you will see in the Action pane on the right side of the screen a Restart option.

## Linux Server Recommendations

For customers that would prefer to use a non-Windows platform, such as a Linux distribution, there are a wide variety of options available to you. The most common and highly supported though will be Apache/Tomcat8. We recommend using this web server in your Linux environment as it has been thoroughly tested and is known to work well with the Spectralink Versity handsets for software updates via HTTP and HTTPS.

Once you've created a new site and specified the physical location to host the software files for your Versity handsets you can place the ZIP archive file and configure the SAM server settings to allow the Versity handset to find the software. You can then trigger software updates from the SAM server, EMM/MDM platform or directly from the SAM client on the handset.

## Windows Desktop Recommendation

For customers that would prefer to not have a fulltime web server active on their network for software updates or people that just need a short term web server to perform software updates in the field, there is one web server in particular that Spectralink recommends. The Abyss web server is available as a free software download here: <https://aprelium.com/abyssws/download.php>. This web server can run independently on your Windows PC and supports the necessary Directory Browsing and Look Ahead functions to allow the phone to connect to the web browser for software updates.

Once you've created a new site and specified the physical location to host the software files for your Versity handsets you can place the ZIP archive file and configure the SAM server settings to allow the Versity handset to find the software. You can then trigger software updates from the SAM server, EMM/MDM platform or directly from the SAM client on the handset.

## Disk Space Recommendations

The Versity firmware files are quite large compared to previous Spectralink product firmware. Most firmware files will be over 1.5GB, yes that's gigabytes. These files are already in a ZIP archive format and must be left that way on the server. You can host multiple firmware files on your server at a time to allow you to deploy different releases to handsets. Spectralink recommends that you maintain a minimum of 20GB of disk space for the Versity software update server site to allow sufficient storage space for multiple software builds and any other storage requirements that may come up.



### Admin Tip

Be aware that when you upload the Versity software files to your OTA server, **do not** change the name of the files or unzip them. The Versity handset is expecting to find a zip file that is named based on the File Selection Criteria information described below.

## Memory

Memory usage will be highly dependent on whether other applications are running on the server. If this server is dedicated to being used as an upload server for Spectralink Versity handsets, then the minimum recommended memory is 12GB.

## Processor

Processor requirements are based heavily on the number of handsets connecting to the upload server. It's estimated that each handset connection, when uploading generated content, will create a 7.023% processor impact over a 1 second period. The average transmission period for a single file upload of 145kb is 0.1 seconds.

For a handset that had been collecting and storing files, because it didn't have access to the upload server, there might be 21 files at an average size of 100kb. With the average upload rate of 145kb in 0.1 seconds we can estimate that all 21 files should be able to be uploaded in 1.4 seconds with an impact to the processor of just over 7% for that single session.

It's important to note that your mileage will vary. There are a lot of variable here that will impact performance and how your server's processor is impacted. System overhead is the biggest impact but there are network overhead challenges and the possibility of network transmission delays that could result in reduced transmission speeds. Anytime the transmission speeds are reduced, the amount of time needed to complete the upload will increase. This all means a much greater impact to the server's processor. Since we do not recommend that all phones be setup to run with Advanced Debugging you are unlikely to encounter issues with processor overload.



### Note

All examples and times provided are based on a single processor dual core system operating with a gigabit ethernet connection on an internal network. All traffic is routed through one test environment into another to simulate a device existing in a voice environment with a server being hosted in a data center or other centralized location.

A typical web server should be run with a minimum of a single quad core processor. Given today's virtualization options we would highly recommend choosing a two to four processors for your upload server.

## Software Update Process

Spectralink Versity has the ability to upgrade at customer locations without requiring physical access to the device. This is achieved via a HTTPS server managed by SAM, EMM or

customer. The Versity software update application is configurable by SAM or the EMM to point to a HTTPS server of the administrator's choice.

There are some changes to the design of the software update process as compared to prior Spectralink Android products. Instead of downloading the image first and then installing the update, the new Android mechanism uses an update engine API to provide a streaming option which combines both the steps into one step. Streaming provides various advantages over the former mechanism followed in previous Spectralink Android products. For example :

- Combines the download and install steps into a single step.
- The updates are seamless. The phone doesn't need to go to recovery mode in A/B update. So, the user is never interrupted.
- The updates are very efficient, i.e., even when the phone undergoes reboot or loss of network, the update would resume from the point it left. So, the system wouldn't again download the already downloaded portion.
- Streaming doesn't require additional storage space. So, even if phone is running low on space, the user would be able to get system updates.

A/B system updates are seamless processes with minimal user impact. Users can continue to use their device during the full software update. The only downtime is when the device reboots into the updated partition.

The Sys Updater app is capable of finding the best available system update file when pointed to a server using the relative path. Or if the relative path includes the file name also, then Sys Updater will start the system update with that specific file. There are two types of Versity software packages, full and Incremental.

Starting with Versity 2.7, Spectralink is decoupling our app and platform releases. This new approach complies with Google policies regarding Android 10 platform releases, and enables the release of app-only updates to our customers, minimizing the impact of platform releases.

Previous Versity updates required a single OTA zip file to be copied to your update server. Starting with this 2.7 release, 3 files will be provided by Spectralink for your update server:

- OTA zip file (containing Versity system software to run the Versity phone platform)
- APK zip file (containing the Versity apps)
- APK sig file (verifies that the APK zip file is not corrupted and contains only the APKs released by Spectralink)

To enable this new approach, the Sys Updater will make 2 checks for updates (instead of a single check as in previous updates): First it will check for an OTA update containing the Versity system software, and install it. After the phone is rebooted to activate the new 2.7 system software, a second check for an APK bundle update (containing the latest Versity apps) is initiated which installs the 2.7 apps.

## Full Updates:

A *full* update is one where the entire final state of the device (system and boot, partitions) are contained in the package. As long as the device is capable of receiving the package and booting the package, it can install the software regardless of the current state of the device.

## Incremental Update:

An *incremental* update contains a set of binary patches to be applied to the data already on the device. This can result in considerably smaller update packages:

- Files that have not changed don't need to be included.
- Files that have changed are often very similar to their previous versions, so the package need only contain an encoding of the differences between the two files.

You can install the incremental update package only on a device that has the appropriate starting software version. For example, if your handset has software version 1.0.0.784 installed and you wanted to update to 1.3.0.1013, you could update using the incremental software build file, "*apollo-ota\_update-signed-1.0.0.784-to-1.3.0.1013.zip*". This file is half the size of the full image for 1.3.0.1013 which would save space on your server and download time as well.

## File Selection Criteria

The Sys Updater application will chose from a list of files on your web server using the following criteria.

- File names must end in zip extension and be lower-case. Others are ignored.
- Dash delimited fields are parsed in the file name:
  - First field must match device name ( "apollo" is the device name for Versity).
  - Second field must match "ota" file type.
  - The next field is "signed"
- The remaining fields contain version information either for full updates or incremental updates:
  - Full update file names with versions greater than the current version in the phone are sorted according to their version number and others are ignored. Full updates must match a dot delimited value with X.Y.Z.B numbers where X.Y.Z indicate branch number and B is the build number.

Example full update files :

apollo-ota\_update-signed-1.0.0.784.zip

- Incremental update file names with a matching “from” (current) version are sorted in a separate list according to the “next” version number. Incremental update file name version fields must match XF.YF.ZF.BF-to-XT.YT.ZT.BT (from-to-next) with “from” and “next” version numbers and the word “to” must be between the two version fields.

Example Incremental files :

apollo-ota\_update-signed-1.1.0.827-to-1.1.0.830.zip

Incremental update file names are preferred over full update file names with an exception. Full update file names are preferred if the highest full update version is greater than the highest incremental update “next” version. In other words, full update file names are preferred if increment update requires more than one version hop.

### Scenario 1

If the phone is on build 1.0.0.721 and the following files are available on the server :

apollo-ota\_update-signed-1.0.0.721.zip

apollo-ota\_update-signed-1.0.0.721-to-1.0.0.741.zip

apollo-ota\_update-signed-1.0.0.741-to-1.0.0.772.zip

apollo-ota\_update-signed-1.0.0.772.zip

The Sys Updater application will select the highest full update apollo-ota\_update-signed-1.0.0.772.zip

### Scenario 2

If the phone is on build 1.0.0.721 and the following files are available on the server :

apollo-ota\_update-signed-1.0.0.721.zip

apollo-ota\_update-signed-1.0.0.721-to-1.0.0.741.zip

apollo-ota\_update-signed-1.0.0.741-to-1.0.0.772.zip

The phone will go through multiple incremental apollo-ota\_update-signed-1.0.0.721-to-1.0.0.741.zip and apollo-ota\_update-signed-1.0.0.741-to-1.0.0.772.zip to reach the highest build 1.0.0.784

### Scenario 3

If the phone is on build 1.0.0.721 and the following files are available on the server :

apollo-ota\_update-signed-1.0.0.721.zip

apollo-ota\_update-signed-1.0.0.721-to-1.0.0.741.zip

apollo-ota\_update-signed-1.0.0.721-to-1.0.0.784.zip

apollo-ota\_update-signed-1.0.0.741-to-1.0.0.772.zip

apollo-ota\_update-signed-1.0.0.772.zip

The OTA app will select the incremental to the highest (1.0.0.784) apollo-ota\_update-signed-1.0.0.721-to-1.0.0.784.zip

## Downgrading

Downgrade can only be performed on Verity starting with release 1.6. Prior versions were incompatible with downgrade intentionally due to Google requirements and to help prevent potential issues with application incompatibilities.

By default the date-time on the file is captured at the time of file creation.

- Files without these fields will be ignored.
- Users should not try to modify file names or repeated errors can occur over a considerable amount of time. Because multiple checks are in place the system will not update to bad file names or images.



### Admin Tip

When using the server directory path, the relative path should point to a valid directory on the sever. The Sys Updater application will stream the build with highest build number than the current build number.

## Software Update Trigger Mechanisms

The Sys Updater system update mechanism can be triggered using one of five different methods:

- On-boot only  
If the polling interval is “On boot only”, then an on demand job is scheduled to be executed by job service which further starts a system update whenever the handset is powered up or rebooted.
- Sys Updater Client Activity (On start of app and click of Check Update button)  
When the Sys Updater application starts, it checks the server for the valid file. Upon finding a valid file, it parses the update zip file for the header info and then starts streaming the update file.
- Background  
If the polling interval is set to a background, then a new job is scheduled with the new periodic interval equal to 4 hours, but it could be longer if the phone is idle and enters Doze mode.

- If the polling interval is set to SAM, persistent job service listens to triggers from SAM/EMM. **After a reboot that applied the new OTA update, a second “Trigger OTA” is required to allow the phone to download and install the APH Update Bundle.**
- Settings> System> About Phone> System updates  
This method uses the Android menus which will open the Sys Updater application and trigger the software update.

# Document Status Sheet

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