Understand Workstation Networking

Brief Overview

This article covers Workstation's foreground and background updates; auto-update, content publish, update detection, and web-app update.

Tasks that involve networking are core functionality in Workstation. Workstation uses networking with a sense of care and prioritizes stability over user experience to avoid overloading focal points, such as proxy servers.
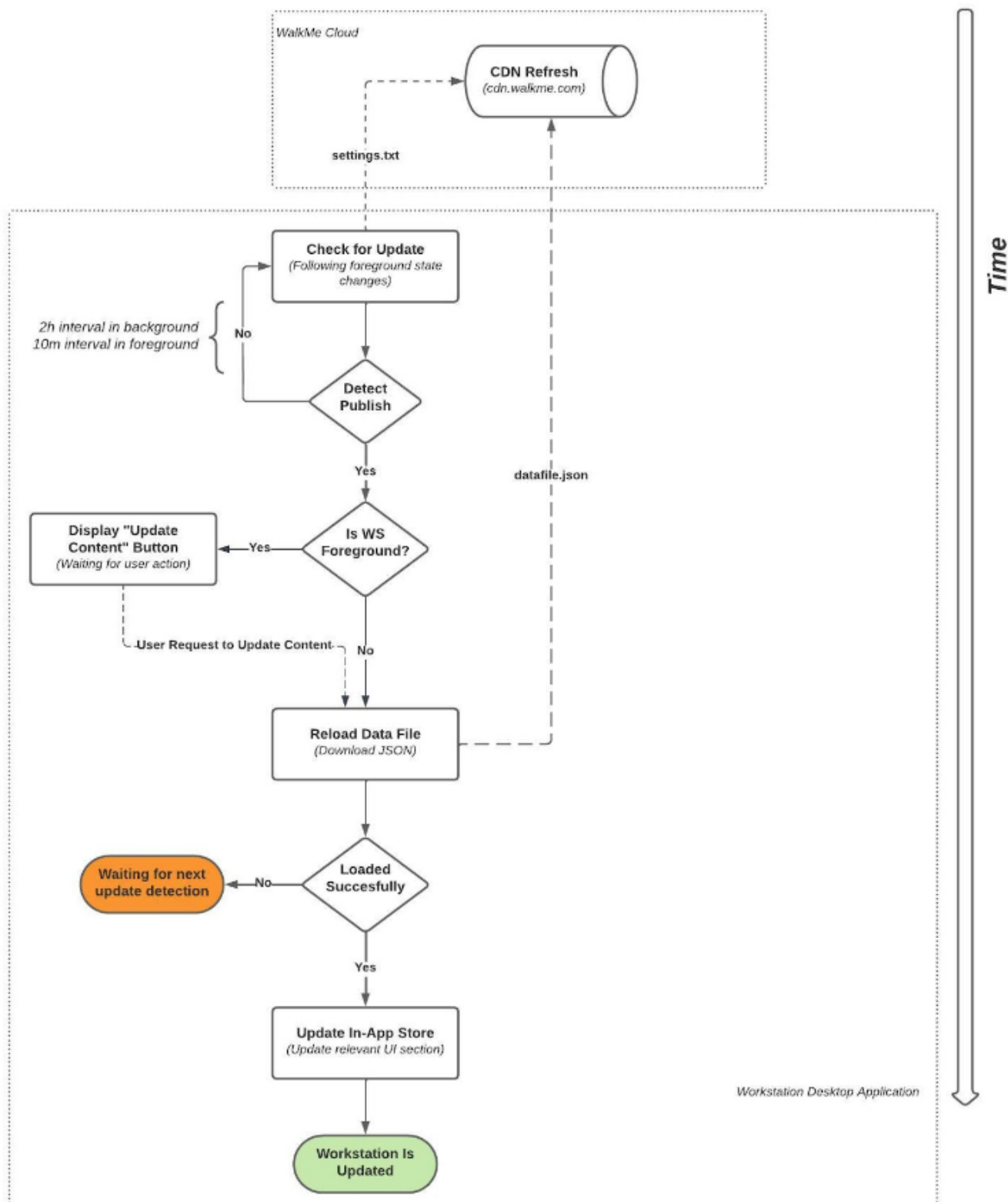
WalkMe Content

Workstation displays content that was created in WalkMe's CMS by the organization's content builders.

This content is shipped and distributed over a static JSON file that is deployed on WalkMe's CDN (cdn.walkme.com). The delivery method for Workstation is similar to WalkMe Web products.

However, as a desktop application, Workstation has no loading-related observation, such as the "load" web event.

Therefore, content publishes checks are tied to the user usage; Workstation will check for content updates as a result of three actions performed by the user:

1. Starting/Refreshing Workstation – when the process starts, the Workstation engine re-downloads the content file (aka JSON file) and displays it to the user.
2. Foreground state changed – known as "in focus" state change; each time the end-user "leaves" Workstation for another application, which is not in a time frame of 30 seconds since the last visit, the engine will check if there was an update ("checking if there was an update" no necessarily proceeds with a download).

WalkMe Cloud

CDN Refresh
(cdn.walkme.com)

settings.txt

Check for Update
(Following foreground state changes)

2h interval in background
10m interval in foreground

No

Detect Publish

Yes

datafile.json

Display "Update Content" Button
(Waiting for user action)

Yes

Is WS Foreground?

User Request to Update Content

No

Reload Data File
(Download JSON)

Waiting for next update detection

No

Loaded Succesfully

Yes

Update In-App Store
(Update relevant UI section)

Workstation Desktop Application

Workstation Is Updated

Time

Content Update Loading Flow

Not every "check for an update" ended with an actual update. Re-download of the content file will happen only when new content or configuration was published by the content builders.

Below figure describes how Workstation pulls the updates and decides if it needs to re-download the content file.

1. Workstation downloads the settings.txt file (1.3 KB) following the above events.
2. Workstation parses the file and compares the 'PublishDate' with its local copy of the file.
3. If there's a later update than its current copy, Workstation will proceed to the next step.
4. Based on the foreground state, Workstation will choose the download strategy;
    1. Prompting an "update content" button for the user
    2. Automatically download the content file in the background
5. Workstation downloads the content file (size usually is a few hundreds of kilobytes, but might be a few megabytes for non-maintained files).
6. Once the content file is downloaded, Workstation will rebuild the local data store and content will be available for the user.

Content Segmentation

WalkMe content can be segmented per department, attributes, and user actions. Each condition is a hashed string, which in the case of user-related information, is evaluated with a remote server.

Evaluation is as consolidated as possible and sent in batch requests to *https://papi.walkme.com/conditions/evaluatedConditions*

Workstation Web Application

The Workstation interface is a web-based solution, based on the React framework. The application comprises of static files (HTML, CSS, JS) that are served from the Workstation CDN – workstation.walkme.com..

The size of the application is 1.3MB, and it all served compressed as gzip.

Workstation loads the web application every boot and manual refresh by the end-user.

The location of the web application is determined by the settings.txt file that was downloaded earlier in the bootstrap process.

WalkMe Analytics

Workstation collects various events to provide usage reporting on Insights and Workstation

Dashboard.

Each event is an HTTPS request, in a size of a few kilobytes, and is sent to ec.walkme.com.
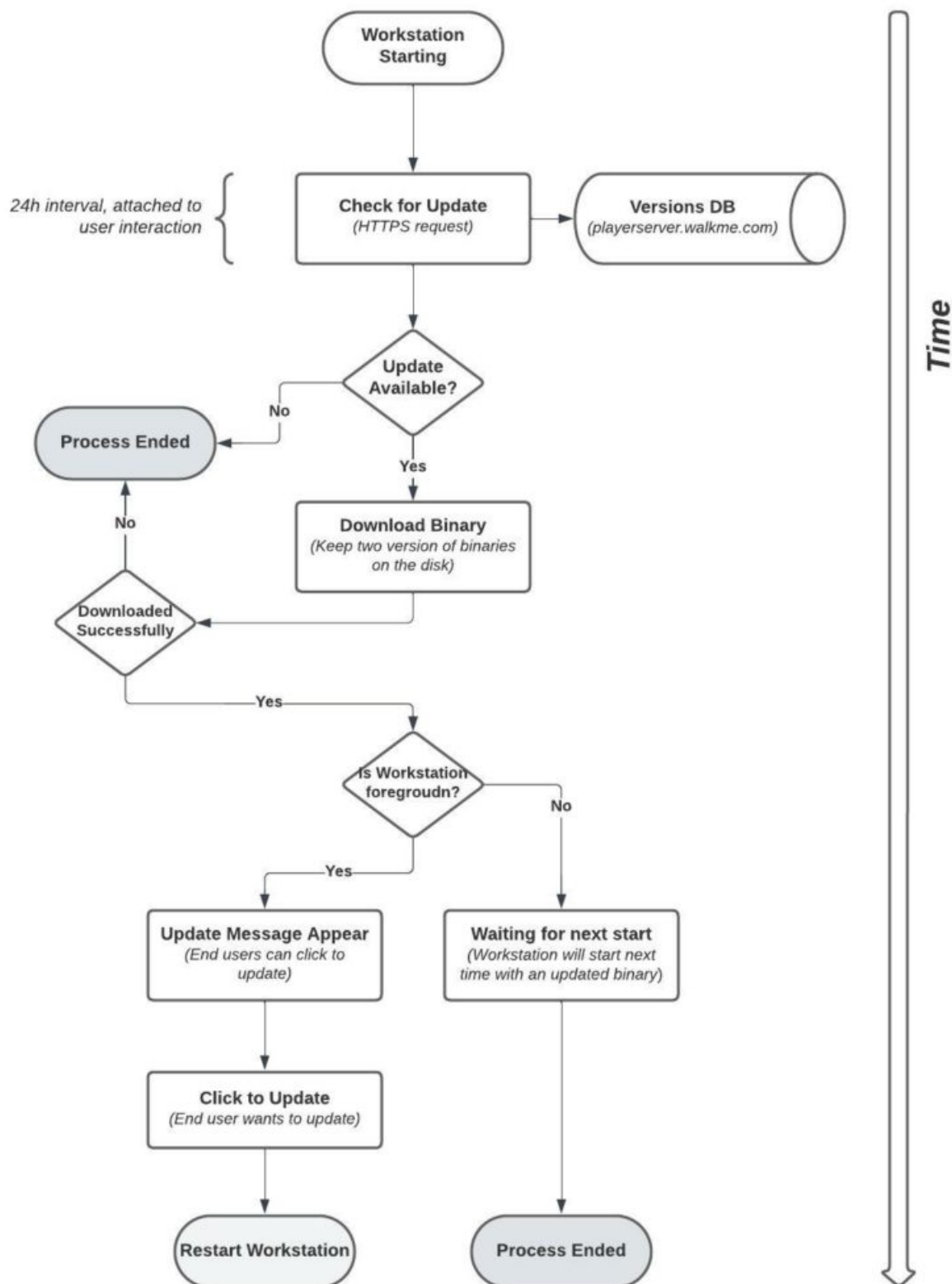
Workstation Binary App Auto Update

Starting version >1.00 of the Electron-based Workstation, an auto-update engine is taking a place to update the binaries, aka the Workstation Container.

Workstation Container is an Electron-based wrapper that performs low-level tasks such as proxy and network certification compatibility, push notifications registration, windows management, and etc.

The Container maintains the life cycle of the web application, and manages the WalkMe Content update mechanism.

The Workstation uses Squirrel as an auto-update facilitator, following the industry-standard recommendation by Electron.

```
                        ┌─────────────┐
                        │ Workstation │
                        │  Starting   │
                        └─────────────┘
                               │
                               ▼
24h interval, attached to   ┌─────────────────┐        ┌──────────────────────┐
user interaction            │ Check for Update │───────▶│    Versions DB       │
                            │ (HTTPS request)  │        │(playerserver.walkme.com)│
                            └─────────────────┘        └──────────────────────┘
                               │
                               ▼
                            ◇ Update
                              Available? ◇
            No ◀───────────────┤
    ┌──────────────┐           │ Yes
    │ Process Ended │          ▼
    └──────────────┘     ┌──────────────────┐
           ▲             │ Download Binary  │
        No │             │(Keep two version │
      ◇ Downloaded       │ of binaries      │
        Successfully ◇   │ on the disk)     │
                         └──────────────────┘
              Yes
                         ◇ Is Workstation
                           foregroudn? ◇
                    Yes ──┤           No
         ┌────────────────────┐   ┌──────────────────────┐
         │ Update Message     │   │ Waiting for next start│
         │ Appear             │   │(Workstation will start│
         │(End users can click│   │next time with an      │
         │ to update)         │   │updated binary)        │
         └────────────────────┘   └──────────────────────┘
                  │                          │
                  ▼                          │
         ┌────────────────────┐              │
         │ Click to Update    │              │
         │(End user wants to  │              │
         │ update)            │              │
         └────────────────────┘              │
                  │                          ▼
                  ▼                  ┌──────────────┐
         ┌────────────────────┐      │ Process Ended │
         │ Restart Workstation│      └──────────────┘
         └────────────────────┘
```

Time

1. Workstation always starts with the latest available binary version (see Versions Maintenance

and Download Failure Overcome section below)

2. On every startup, Workstation sends an HTTPS request to check if there's a more up-to-date version than the current.
   - When Workstation starts or is refreshed, it will check if there are any new versions instantly. If there are no new versions on start, it will check again one more time when the user engages with Workstation in the next 12 hours. This means that a check is done once every 12 hours if the user opens the app window, if they do not, it will only update when the app is re-launched or refreshed.
3. Workstation will start downloading the binaries and store it in the Workstation installation folder.
4. Once the download is finished successfully, Workstation will implement one of the below strategies:
   - Workstation is foreground/background – user will be notified about the update and will be asked to relaunch Workstation – "Click to Update"
   - Workstation is off – next startup will be using the newer binary.

Versions Maintenance and Download Failure Overcome

The auto-update mechanism keeps two binary versions at a single time to overcome download failures.

Before switching to the newer version, the auto-update engine will hold two completed versions; the current + previous and the new uncompleted version.

Following the completed download, the auto-update version will erase the previous version and will hold two versions; current + next.

Binaries on file system while downloading newer version

Previous Version (v2.1.2)	Current Version (v2.2.0)	Next Version (v2.3.0) Downloading
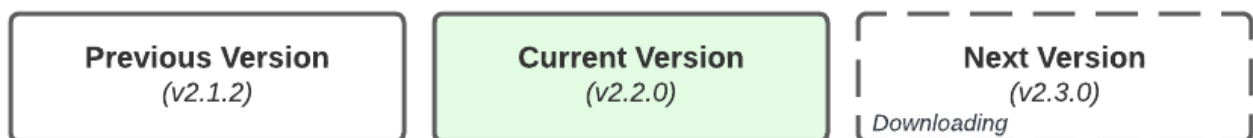
Bainaries on file system after newer version downloaded and started

| Previous Version (v2.2.0)	Current Version (v2.3.0)

Note that v2.1.2 was removed from the file system when v.2.3.0 turned current.

User-Related Actions

Workstation invites users to engage with it by connecting third-party applications, such as SharePoint, Confluence, Jira, and many others.

Any connection is using the network, whether the application is self-hosted or a SaaS.

Connecting third-party applications initiates OAuth2.0, SMAL, or OAuth1.1 authentication flows that are using the network.
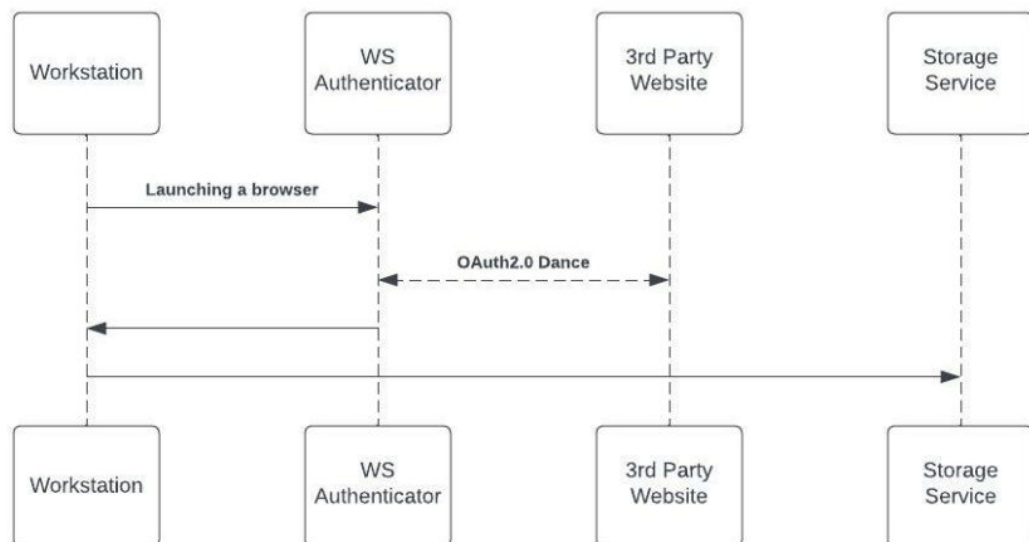
Once the connection is established, Workstation will query its server to provide the interface with content sourced in the third-party application. Each third-party application generates at least one HTTPS request each time the user brings Workstation to the foreground.
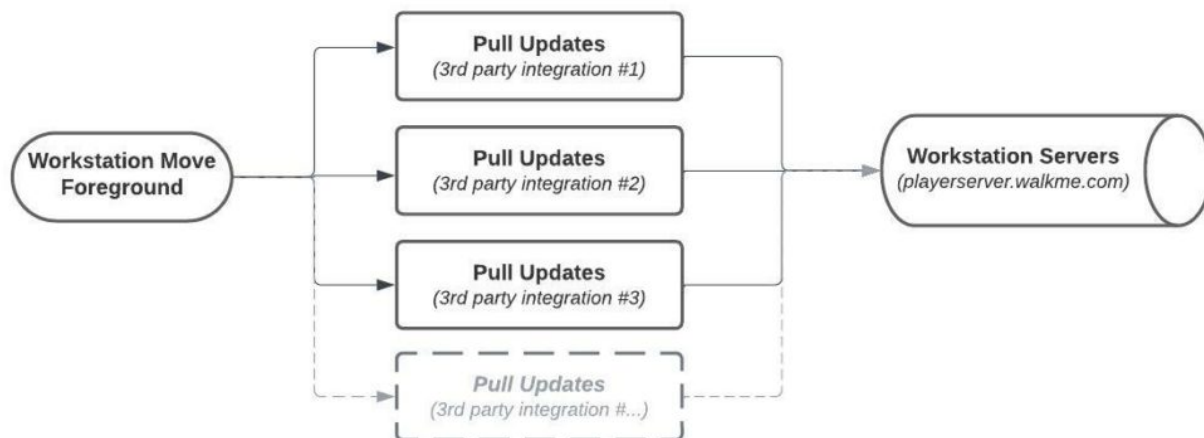
Enterprise Search Activity

Besides the above automatic updates, users can initiate searches in their third-party applications. Each search triggers an HTTPS request that collects the results from the remote servers.