



USERFUL™

Network Design Requirements

Version 1.2
November 2021

Revision History

| Version | Date | Notes | Author |
|---------|-------------------|---|---------------|
| 1.0 | December 2020 | Initial Release | Greg Mitchell |
| 1.0.1 | January 21, 2021 | Minor fixes | Greg Mitchell |
| 1.1 | June 25, 2021 | Emerald CMS Rules | Greg Mitchell |
| 1.2 | November 22, 2021 | Adjusted internet rules for on-prem servers | Greg Mitchell |

Introduction

The Userful Visual Networking Platform leverages your existing conventional network assets to deliver visual content.

This document describes how to ensure your network makes full use of Userful and is configured to allow Userful to function to its full potential.

If you have any further questions or comments on this article, contact your Userful Account Manager or Userful Sales Engineer, or email info@userful.com.

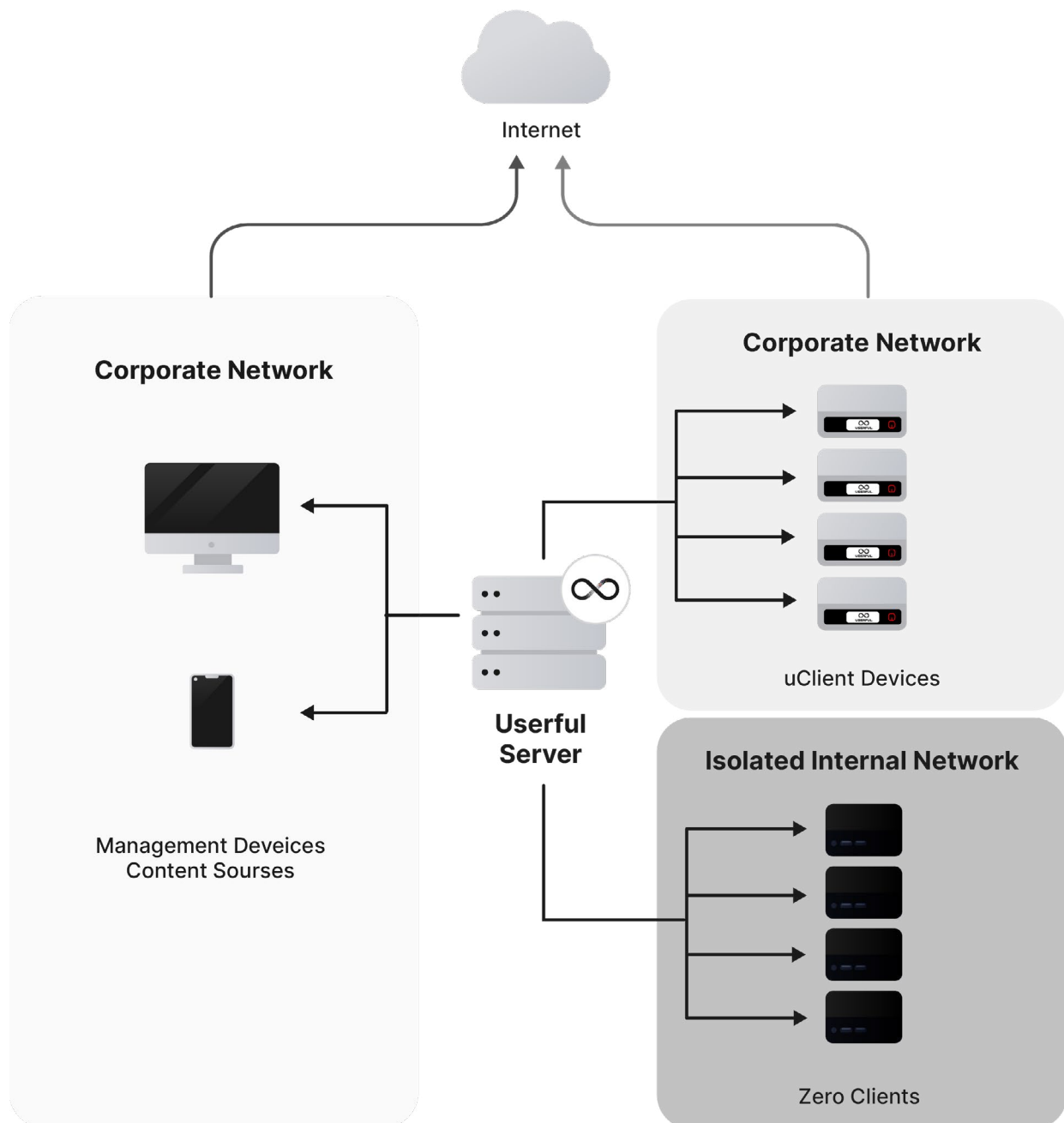
Index

| | |
|---------------------------------|----|
| Introduction | 3 |
| Useful On-Premise | 5 |
| Network Structure | 6 |
| uClients | 6 |
| Zero Clients | 6 |
| Network Addressing | 6 |
| uClients | 6 |
| Zero Clients | 6 |
| Network Capacity | 7 |
| Network Firewall | 8 |
| Server Rules | 8 |
| Zero Client Rules | 9 |
| uClient Rules | 9 |
| Useful Cloud | 10 |
| Network Structure | 10 |
| Network Addressing | 11 |
| Network Capacity | 11 |
| Network Firewall | 11 |
| Emerald CMS IP Addresses | 12 |

Userful On-Premise

Network Structure

On-Premise servers actively stream video data to their endpoints. To do this reliably while not interfering with other network traffic, dividing traffic into separate Layer 2 network segments is a design requirement of Userful.



uClients

uClients on LG WebOS or Android must be able to access both the On-Premise server and the Internet to receive both uClient App updates and device firmware updates. They do not need to access the corporate LAN directly. uClient can operate on a completely isolated network, however, provisions must be taken to distribute App and Firmware updates to the devices manually when the Server receives updates.

- App updates can be distributed from On-Premise servers or manually with a USB flash drive
- Firmware updates for LG WebOS are distributed from the Internet or can be installed on the device with a USB flash drive
- Firmware updates for the Userful uClient Adapter are not yet supported

uClients can also cross subnets if they have access to cloud-connect.userful.com via TCP port 443 and are still connected to the same subnet as the On-Premise server.

If the entire Userful system is going to be placed offline, with no access to updates or the Internet, then it is recommended that Zero Clients be used if possible.

Zero Clients

Zero Clients can be placed on a completely isolated network, with access to nothing except the Userful server itself. Any firmware updates for Zero Clients are distributed from the server itself, and Zero Clients require no Internet connection to function.

Network Addressing

All types of clients seek DHCP leases on their wired interfaces when new out of the box. Ideally, a DHCP server should be available to hand out leases. If not, other measures need to be taken.

uClients

uClient devices can have their network settings configured on the device itself, using attached or included peripherals.

Zero Clients

Zero Clients cannot be managed locally. They will self-assign to themselves an IP address of 10.254.10.10 if they receive no response to their DHCP query after a few minutes. In this state, they are not addressable from Userful and may assign themselves conflicting IPs.

Once zero clients have IP addresses on the same network as the Userful server, they can be managed and IP settings changed from the Userful Control Center.

Network Capacity

Zero Clients and uClients have different network specifications that must be met for reliable operation.

| | Zero Clients | uClients |
|----------------------------|--|--|
| Stream Type | JPEG | RTSP |
| Bandwidth usage per device | ~100Mbps @ 1080p60 | ~14Mbps @1080p60 ~40Mbps @4K60 |
| Connection to endpoint | 1Gbps | 100Mbps |
| Wifi Available | No | Yes, but not supported for on-premise applications |
| Latency tolerance | Under 5ms | Unlimited |
| Displays per 1Gbps uplink | 10-12 | ~50 |
| Displays per 10Gbps uplink | 16 independent displays* 36 in a single video wall* | 100+ |

*Driver limitations limit network interface throughput to Zero Clients at 2.5Gbps

Network Firewall

Server Rules

The following **Internet** destinations should be accessible by the Userful server for complete connectivity and support.

| Protocol | Port | Destination | Rule | Description |
|----------|------|--|--------|--|
| TCP | 443 | updates.userful.com updates2.userful.com umirror2.com cloud-connect.userful.com | Out | Software Updates Userful Manager Licensing |
| TCP | 443 | remote.userful.com | Out | Support VPN |
| TCP/UDP | 3478 | turn.userful.com | In/Out | Remote content upload and (optional) webcam |

The following **local** ports must be accessible from the corporate LAN to allow browser-based access and operation of Userful.

| Protocol | Port | Destination | Protocol | Description |
|-----------|-------|-------------|----------|------------------------|
| TCP | 5353 | LAN | | Peer Discovery |
| TCP | 5701 | LAN | | Failover |
| TCP | 9000 | LAN | HTTP | Userful Control Center |
| Multicast | 54327 | 224.2.2.3 | | Failover |
| UDP | 54327 | LAN | | Failover |
| TCP | 54328 | LAN | | Failover |

These local ports from the **corporate LAN** on an On-Premise Server are optional.

| Protocol | Port | Destination | Protocol | Description |
|----------|--------------|-------------|----------|------------------------|
| TCP | 21 | LAN | FTP | FTP File Transfer |
| TCP | 22 | LAN | SSH | Local SSH |
| TCP | 80 | LAN | HTTP | Redirects to 9000 |
| TCP/UDP | 137-139, 445 | LAN | SMB | Windows File sharing |
| TCP/UDP | 631 | LAN | HTTP | Printer Configuration* |

*Public Computing deployments only.

uClient Rules

The following ports and services must be available between a Userful On-Premise server and endpoints running uClient and between uClient and the Internet for proper operation.

| Protocol | Port | Destination | Description |
|----------|-------|---------------------------|-------------------|
| TCP | 443 | cloud-connect.userful.com | Userful Manager |
| UDP | 123 | Server | NTP |
| TCP | 8554 | Server | RTSP Streaming |
| TCP/UDP | 14725 | Server | Video Sync |
| TCP | 14276 | Server | Video Sync |
| UDP | 16668 | Server | uClient Discovery |

Zero Client Rules

Zero Clients must be placed on a separate network from the Corporate network. They will use these ports and protocols to communicate with the Userful server. **It is strongly recommended that access be unrestricted on this network.**

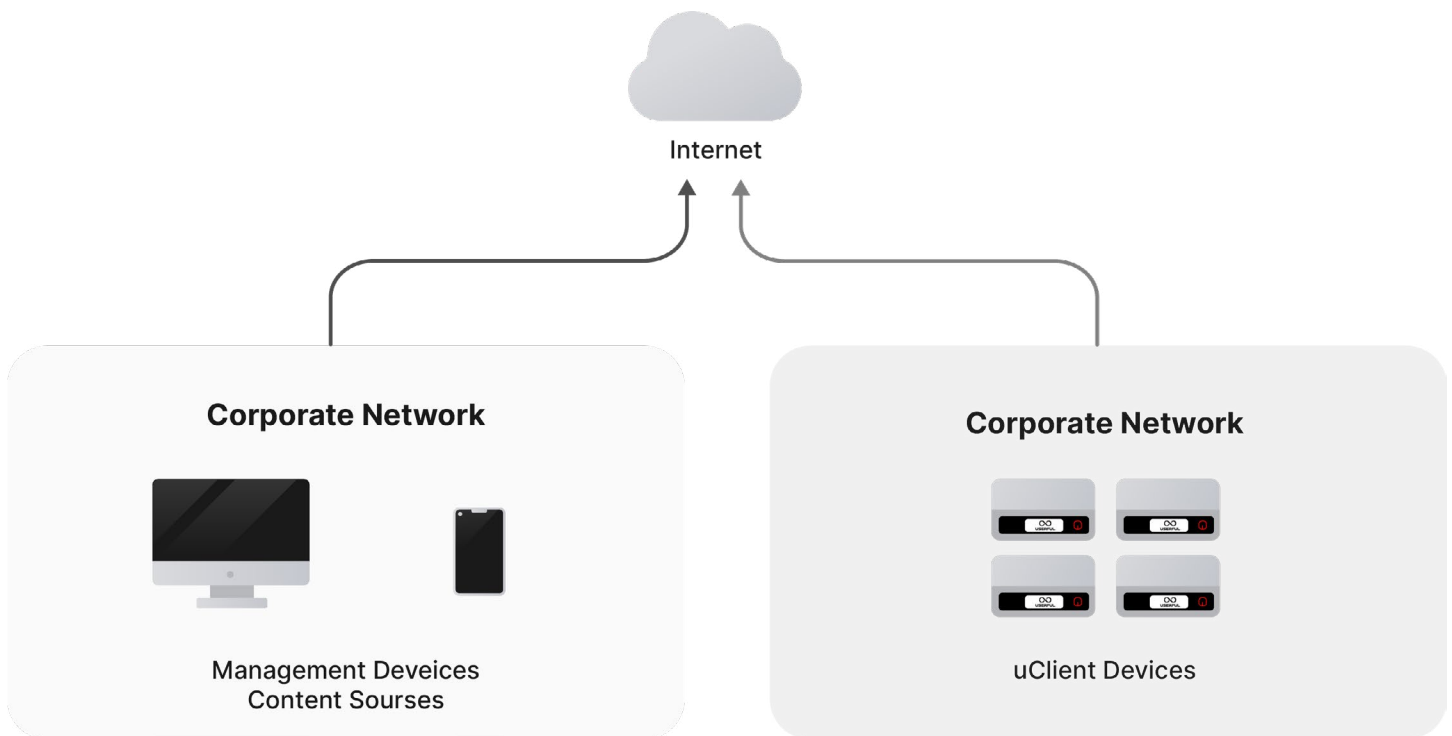
| Protocol | Port | Destination | Description |
|----------|----------------------|--------------|-----------------------|
| UDP | 26668 | Zero Clients | Zero Client Discovery |
| TCP | 52330 | Zero Clients | Zero Client Discovery |
| UDP | 52330 - 52630 incl. | Zero Clients | Zero Client Discovery |
| TCP/UDP | Various High Numbers | Zero Clients | Zero Client Discovery |

Userful Cloud

Userful uClients can sync to Userful Cloud servers without any other local hardware or server. They are synced and managed entirely from the Cloud web service, which is hosted by Userful in AWS.

Zero Clients can not be used with Userful Cloud, they can only be paired to a local On-Premise server.

Network Structure



uClients connecting to Userful Cloud are not required to occupy a separate network, but doing so is still a recommended best-practice.

Most uClient devices come with wireless interfaces. These are not supported for On-Premise deployments and are not recommended for Cloud deployments.

Network Addressing

uClient devices come out of the box querying for DHCP on their local wired interfaces. They can be manually locally configured with static IPs.

Network Capacity

uClients download content from Cloud servers in Useful Manager to internal storage for local playback. They do not have particular bandwidth or latency requirements, other than Internet bandwidth that is sufficient to distribute large content files, and local communication for synchronization is reliable.

Network Firewall

uClient devices must be able to communicate with the Internet to sync with Useful Manager, and also must be able to communicate with each other across the local network to maintain content synchronization.

| Protocol | Port | Destination | Description |
|----------|-------|---------------------------|-----------------------|
| TCP | 443 | cloud-connect.userful.com | Userful Manager |
| UDP | 123 | Other uClients | NTP |
| TCP | 8554 | Other uClients | RTSP Streaming |
| TCP/UDP | 14725 | Other uClients | Video Synchronization |
| TCP | 14276 | Other uClients | Video Synchronization |
| UDP | 16668 | Other uClients | uClient Discovery |

Emerald CMS IP Addresses

If your deployment includes the use of the Userful Emerald CMS, you will need to ensure that your On-Premise Servers and/or uClient devices are able to access the Emerald IPs on TCP port 443:

- 205.185.216.10 (Files)
- 52.217.39.148 (Files)
- 162.243.189.2 (Files)
- 45.55.116.139 (API)
- 134.209.131.177 (API)
- 172.217.2.227 (API)