



Toast Network Requirements

A Guide for Self Managed/Third Party Managed Networks

Toast provides all necessary network infrastructure during a standard deployment to operate with minimal configuration or manipulation on the customers behalf. However, there are instances where customers choose to have a “Self Managed Network ” (“SMN”), or have a “Third Party Service Provider” (“TPSP”) manage the network for them. In such cases, Toast recommends that the network and implementation still be deployed using the specifications that Toast installs with, as this will help Toast Support in the event that you need to call in for assistance. Below is the list of requirements/preferences for deploying Toast in order to ease troubleshooting if situations should arise.

IP Schema and Range Reservations:

- Toast operates on the **192.168.192.0/24** network with a gateway of **192.168.192.1**.
- Our printers come shipped by default starting with device IP **192.168.192.169** and increase incrementally as printers are needed.
- If you choose to run a different scheme, you will need to program the Epson Printers using [EpsonNet Config](#) (Instructions in link).
- You should reserve the following IP ranges for Toast:

| IP Range | Reason for Reservation |
|-----------------------------------|------------------------------|
| 192.168.192.2 - 192.168.192.25 | Reserved for Toast Terminals |
| 192.168.192.168 - 192.168.192.200 | Reserved for Toast Printers |

Firewalls, Whitelisting, and configuration:

- The router/firewall should provide **unrestricted access to outbound traffic** on the Toast VLAN.
- If this is not possible, the following URL destinations need to be configured for **unrestricted outbound traffic** on ports 80 and 443.
- See the firewall whitelist here: [Toast Firewall Allowlist](#) for the most up to date list of ports, wildcards and other information around using toast with a firewall.
- In the event that you choose to use whitelisted, restricted access, you will need to consult your TPSP to troubleshoot before contacting Toast.

Wired Network Infrastructure:

- All wiring should be **Cat5e or higher** cabling and properly terminated in the EIA/TIA568B wiring standard. Toast implementers do not perform any cabling requests longer than 10', through walls, or in crawl spaces/open air-areas due to the varying codes in relation to how and what wiring is to be used for networking installations.
- The router/firewall should have Quality of Service (QoS) setup to ensure sufficient bandwidth is dedicated for Toast. Toast recommends the following **minimum speeds** based off of hardware installation scenarios:

| Devices operating Toast | Download Speed (Mbps) | Upload Speed (Mbps) |
|--|------------------------------|----------------------------|
| ~ 2 Tablets, 1 KDS, ~250 orders/day | 3 Mbps | 1 Mbps |
| ~ 10 Tablets, 2 KDS, ~1,000 orders/day | 7 Mbps | 1 Mbps |
| ~ 30 Tablets, 4 KDS, ~2,000 orders/day | 15 Mbps | 5 Mbps |

- The **minimum speeds** above should be dedicated strictly for Toast. In the event that these speeds cannot be dedicated for Toast alone, please consult your ISP to increase speeds, or reach out to your Toast Project Resource to discuss solutions.

Physical Network Segregation & VLANs:

- Toast recommends that the network be **physically** segmented from other outside traffic/network communications. This means that all Toast specific networking components, including: Terminals, Printers, Access Points, KDS, peripherals, etc.
- Non-Toast network devices, such as network components, computers, routers, tablets, cell phones, and repeaters should not be connected to the same network as Toast.
- In the event that you cannot **physically** segment the network, a **logical** segmentation, or **VLAN** can be utilized. In order to do this, the following configuration will need to be performed:
 - A **VLAN** should be setup for the Toast POS network, separate from all other traffic
 - This **VLAN** should have the IP scheme of 192.168.192.0/24.
 - At least 1 physical ethernet port mapped to this VLAN should be available for each IP device.
 - The ports should be clearly labeled "**FOR TOAST USE ONLY**".
 - Non-Toast devices should **NOT** be connected to this **VLAN**.
- Please see the next page for a sample wiring diagram. This diagram can be used as a reference point when working with contractors, low voltage technician, and other parties who you may choose to facilitate the installation of electrical and networking components/wiring.

TOAST NETWORK DIAGRAM

REV.1 2019

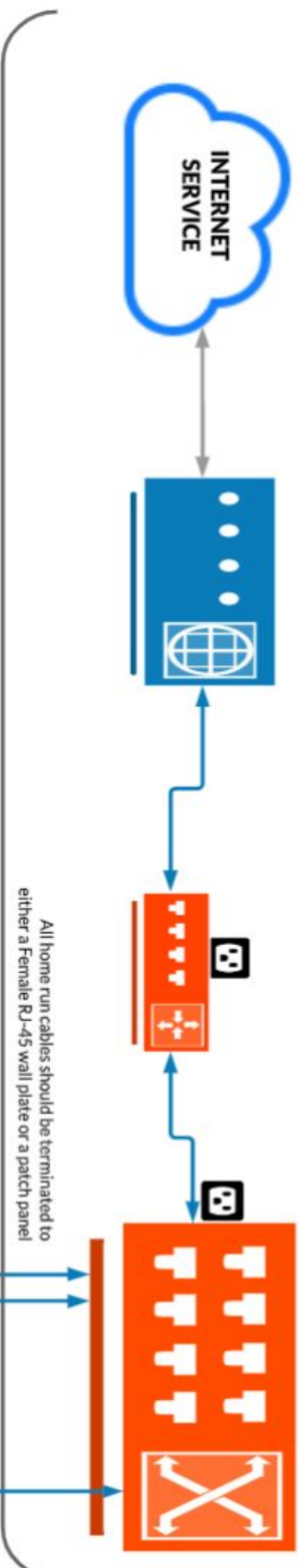


NETWORKING AREA

CUSTOMER MODEM:
MUST HAVE 1 PORT OPEN
FOR TOAST

TOAST ROUTER:
FOR TOAST DEVICES ONLY
(MERAKI Z3 or MXX64)

TOAST NETWORK SWITCH:
FOR TOAST DEVICES ONLY
(NETGEAR 8/16/24/48 port or similar)



LEGEND:



WALL MOUNTED FEMALE RJ-45 JACK



STANDARD POWER RECEPTICLE with a 120v ground circuit



CAT5e / CAT6 ETHERNET CABLING (RUN BY CUSTOMER)

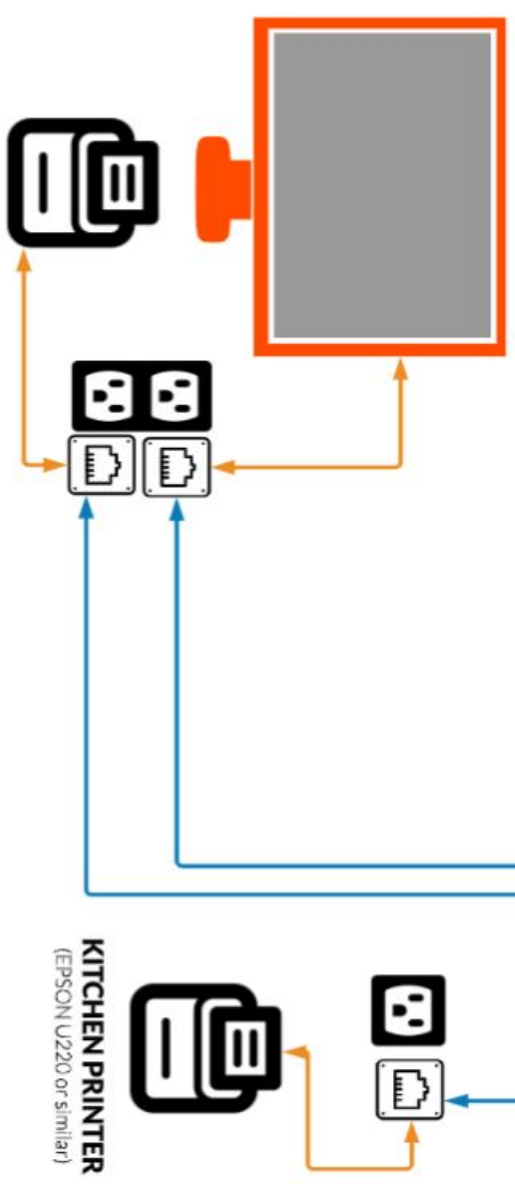


PATCH CABLE (PROVIDED BY TOAST)



WIFI DEVICE - NO CABLING REQUIRED

Remember, Toast does not provide mounting, cabling, or any form of drilling services, and the cost for those services is not reflected in any Toast quote. Please be aware that failure to follow the instructions outlined here could incur additional fees.



TERMINAL / RECEIPT PRINTER
(ELO 10V/15" Workstation + Epson T20 or similar)

KITCHEN PRINTER
(EPSON U220 or similar)

EACH ADDITIONAL DEVICE ON YOUR ORDER WILL REQUIRE ADDITIONAL CABLING FOLLOWING THE SAME WIRING SCHEME AS OUTLINED ABOVE

Wireless Network Infrastructure:

- All wireless communications should be set to operate 5Ghz band, and should be set on the “least utilized channel”. Toast does not use the 2.4Ghz channels for Implementation as there are a lot of devices, appliances, and technologies that communicate near this band that can cause interference and connectivity issues with handhelds and your Toast network. Failure to do so can cause issues with order sending, order timing, and overall performance of the tablets, handhelds, and Toast network services.
- To verify the least used channel, an example of a spectrum analyzer is [Wifi Analyzer by Farproc](#) or the [WiFiman app by Ubiquiti](#) - available on the Google Play store.
- Access points are to be installed in centrally located positions in the restaurant, away from Electromagnetic Interference (“EMI”) sources (such as Microwaves, speakers, motors, refrigerators, etc.) to prevent signal interference and connectivity issues with handhelds and your Toast network.
- Access to the network should never drop below -65dBm in service areas where handhelds will be accessing the Toast network. Failure to do so can cause issues with order sending, order timing, and overall performance of the tablets, handhelds, and Toast network services. If you’d like to test signal strength in the restaurant, an example of a spectrum analyzer is [Wifi Analyzer by Farproc](#) or the [WiFiman app by Ubiquiti](#) - available on the Google Play store.
- If using wireless, the SSID for Toast use **should belong to the same Virtual Local Area Network (“VLAN”)** that was set up for Toast POS network. If the Toast SSID is not set up for the same VLAN print routing will be negatively affected.
- The SSID should be broadcasted, using WPA2/AES Personal encryption. The key should be provided to Toast in the event that support needs to be contacted, they’re prepared and have the credentials to provide proper troubleshooting.

SELF MANAGED/TPSP MANAGED CHECKLIST

WIRED NETWORKING

| | YES | NO |
|--|-----|----|
| All networking cabling is Cat5e or higher specification cabling with EIA/TIA-568B terminations | | |
| I have QoS setup to ensure that Toast is receiving 15Mbps Download and 5Mbps Upload speeds | | |

WIRELESS NETWORKING

| | | |
|---|--|--|
| I have setup the wireless communications to broadcast on the 5Ghz band, using the least utilized channel | | |
| I have installed the Access Points in a centrally located area, away from EMI sources, such as TVs, Microwaves, Speakers, etc. | | |
| I have tested the network to ensure that all networking signal strength ("RSSI") is -65dbm or better | | |
| If I am using a VLAN, the SSID being broadcast on the same VLAN as the printing and terminals - failure to do so will cause printing problems | | |
| The SSID is being broadcast visibly, with WPA2/AES encryption and I have provided Toast with this passcode | | |

IP SCHEMA AND RANGE RESERVATIONS

| | | |
|--|--|--|
| I have set my network/applicable VLANs to operate on the 192.168.192.xxx /24 network schema | | |
| I have reserved the IP ranges 192.168.192.1 - 192.168.192.25 for Toast Terminals, and 192.168.192.168 - 192.168.192.200 for Toast printers | | |

FIREWALLS, WHITELISTING, AND CONFIGURATION

| | | |
|---|--|--|
| The router is providing unrestricted access to OUTBOUND TRAFFIC | | |
| *If NO above, I have configured the URL destinations under "Toasts Firewall Whitelist" for UNRESTRICTED ACCESS TO OUTBOUND TRAFFIC on Ports 80 and 443 | | |

In the event networking issues arise, You and/or Toast may need to contact your managed provider. Please ensure that your provider has supplied you with all applicable information, whether matching the above configuration or not, to aide Toast in the event you need to contact Toast Support and we need to contact your TPSP.

In the event Toast needs to send a technician onsite due to issues with your SMN/TPSP managed network, you will be charged in coincidence with Toasts' onsite fees listed here: <https://central.toasttab.com/s/article/Services-Rates-and-Fees>