



Transform Any x86-64 PC and Laptop Into a Secure, Centrally Managed Endpoint

Microsoft Azure Virtual Desktop (AVD) and Windows 365 Cloud PC

Quick Start Guide



NComputing[®]

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ABOUT THE PRODUCT:

NComputing LEAF OS is a next-generation software endpoint solution that transforms any x86-64 PC or laptop into a secure and centrally managed endpoint.

Designed and optimized for **Citrix DaaS**, **Citrix Virtual Apps and Desktops**, **Microsoft Azure Virtual Desktop (AVD)**, **Microsoft Windows 365 Cloud PC**, **Microsoft Remote Desktop Services (RDS)**, **vSpace Pro Enterprise**, **VERDE VDI and Remote Access**, LEAF OS delivers a secure computing environment to access virtual desktops and virtual apps from any x86-64 system. It can be used as a self-contained operating system when booted from a USB drive. This methodology leaves the user's existing operating system, files, and hard drive untouched while providing an ideal environment for work-from-home use cases. When users finish their work, a simple reboot to their native OS restores their device to personal use.

Alternatively, LEAF OS can be used to repurpose PCs and laptops by converting any x86-64 hardware from a stand-alone computer to a dedicated thin client by installing directly onto an internal hard drive, removing the old system and files. This method extends the usefulness of aging computers using end-of-life operating systems like Windows 7 while giving users powerful up-to-date desktops.

LEAF OS also comes with integrated local **Chromium browser** support, provides additional flexibility such as web kiosk mode or productivity mode with direct access of web content and web apps without desktop virtualization. Other popular applications such as local **Microsoft Teams** and **Zoom** are supported.

LEAF OS devices can be remotely managed by the IT admin. LEAF OS devices provide a simple to deploy, centrally managed, high performance virtual desktop, designed and optimized for Microsoft AVD and Windows 365 Cloud PC deployment for organization of any size.

Features highlights:

- Premium performance and native dual display
- Multimedia enhancement through Microsoft RemoteFX
- [Citrix](#), [Microsoft AVD](#), [Windows 365 Cloud PC](#), [Microsoft RDS](#), [VERDE VDI](#) & [Remote Access](#), and [vSpace Pro Enterprise](#) desktop virtualization support
- Integrated local Chromium browser, Microsoft Teams and Zoom application support providing additional flexibility for direct access to unified communication, web content/web apps without desktop virtualization.
- Native Microsoft AVD SDK integration for optimized performance
- NComputing vCAST Streaming technology with SuperRDP software (separate license required)
- Broad USB peripheral support
- Integrated [PMC Endpoint Manager](#) software
- Flexible deployment through Gigabit Ethernet or Wi-Fi support

ABOUT NCOMPUTING'S LEAF OS SOFTWARE ENDPOINT SUPPORT FOR MICROSOFT AVD

Microsoft AVD is officially supported on LEAF OS software endpoints, NComputing RX420(RDP) and RX-RDP+ thin clients, based on native AVD client integration. The AVD client included supports both AVD Spring 2020, Fall 2019 releases and Windows 365 Cloud PC.

Following are the Azure Virtual Desktop client features that are supported on LEAF OS software endpoints, RX420(RDP) and RX-RDP+ thin clients:

- Microsoft Azure Virtual Desktop (AVD)
 - Azure Commercial Cloud
 - Spring 2020 release (ARM)
 - Fall 2019 release (Classic)

- Azure Government Cloud
- Microsoft Windows 365 Cloud PC
- Multi-Factor Authentication (MFA)
- RemoteApp programs and desktops
- Regular vs. Kiosk mode auto-login
- Support for peripheral devices:
 - USB webcams for video conferencing
 - USB mass storage
 - HDMI, analog and USB audio
 - USB smart card readers and security keys
 - USB printers and network printers
 - Other USB devices through Generic USB redirection

Additionally, the LEAF OS software endpoints have the following features:

- Native dual display support with independent screen rotation
- Local applications:
 - Chromium browser
 - Microsoft Teams
 - Zoom
 - Custom applications (deployed from a package or defined as a system application)
- Support for LEAF OS extension modules

LEAF OS SOFTWARE ENDPOINT AVD QUICK START GUIDE

AVD and Windows 365 virtual machine configuration for best user experience:

The AVD clients integrated in NComputing endpoint devices support the use of H.264/AVC encoding (Advanced Video Codec) in AVD sessions. Using AVC ensures the best AVD user experience. To take advantage of this H.264/AVC graphics mode, the following Group Policy setting **must be enabled**:

Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Remote Session Environment: Prioritize H.264/AVC 444 graphics mode for Remote Desktop Connections

In simplest case, this Group Policy setting can be configured on the local machine with Local Group Policy Editor (gpedit.msc).

AVD and Windows 365 virtual machine configuration for webcam redirection:

The AVD clients integrated in NComputing endpoint devices support the native (functional) redirection of USB webcams. To ensure proper webcam redirection, please make sure that the following Group Policy setting is not enabled:

Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Device and Resource Redirection: Do not allow video capture redirection

In simplest case, this Group Policy setting can be configured on the local machine with Local Group Policy Editor (gpedit.msc).

Additionally, each user under Settings > Privacy > Camera, needs to allow the applications to access the camera.

Note: Webcams described as driverless Windows webcams (webcam not requiring any special vendor drivers to work on Windows) or Video for Linux version 2 compliant webcams should work.

AVD and Windows 365 virtual machine configuration for printers redirection:

The AVD clients integrated in NComputing endpoint devices support the native (functional) redirection of local printers. USB and network printers are supported. To ensure proper printers redirection, please make sure that the following Group Policy setting is not enabled:

Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Printer Redirection: Do not allow client printer redirection

Printer drivers appropriate for the redirected printers must be installed on the AVD VM for successful printers redirection. 'x64, Type 3 - User Mode' printer drivers need to be installed. The 'Remote Desktop Easy Print' driver cannot be used with printers redirected from NComputing endpoint devices. To prevent the attempts to use this unsupported driver, the following Group Policy setting can be disabled in Computer Configuration or User Configuration

Computer/User Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Printer Redirection: Use Remote Desktop Easy Print printer driver first

In simplest case, the above mentioned Group Policy settings can be configured on the local machine with Local Group Policy Editor (gpedit.msc).

AVD and Windows 365 virtual machine configuration for smart cards redirection:

The AVD clients integrated in NComputing endpoint devices support the native (functional) redirection of smart cards (smart card readers). CCID-compliant and ACS smart card readers are supported. Refer to firmware Release Notes for full list of supported smart card readers. To ensure proper smart cards redirection, please make sure that the following Group Policy setting is not enabled:

Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Device and Resource Redirection: Do not allow smart card device redirection

In simplest case, this Group Policy setting can be configured on the local machine with Local Group Policy Editor (gpedit.msc).

AVD and Windows 365 virtual machine configuration for Generic USB redirection of peripheral devices:

The RDP and AVD clients integrated in LEAF OS devices support the Generic USB redirection of peripheral devices. In Windows Server 2016/2019 and Windows 10 the 'Do not allow supported Plug and Play device redirection' Group Policy setting is enabled by default (when not configured), which prevents the Generic USB redirection of the peripheral devices to those operating systems. This Group Policy setting can be found under 'Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Device and Resource Redirection'.

To be able to use the Generic USB redirection of LEAFOS, RX420(RDP) and RX-RDP+ peripheral devices, this policy must be explicitly disabled. This Group Policy setting can be deployed through Active Directory Group Policy Objects or, in simplest case, it can be configured on the local machine with Local Group Policy Editor (gpedit.msc).

In Windows Server 2012 R2, Windows 8.1 and older Windows server and desktop operating systems the Remote Desktop Services by default allows the redirection of supported plug and play devices, thus the 'Do not allow supported Plug and Play device redirection' Group Policy setting does not need to be altered.

STEP (1) INSTALL AND ACTIVATE LEAF OS SOFTWARE ENDPOINT

Skip this step if you are using [NComputing EX500 thin client](#).

Download and prepare LEAF OS installation

1. From NComputing Software Download page, select "LEAF OS" and download the compressed image (i.e.ZIP)
2. Extract the .IMG file (~1GB) in the downloaded .ZIP file
3. Create a bootable LEAF OS installer USB memory stick (use at least 2GB or higher capability):
 - a. Use a flashing application like the [Win32 Disk Imager](#) or [balenaEcher](#) to write the image into your USB stick.
4. Pick an x86-64 PC/laptop (BIOS or UEFI).
 - a. Access the PC/laptop's [Boot Menu](#) or change the PC/laptop BIOS setting to set external USB storage device at the top of the booting priority list.

Installation option #1 (live boot LEAF OS using USB memory stick)

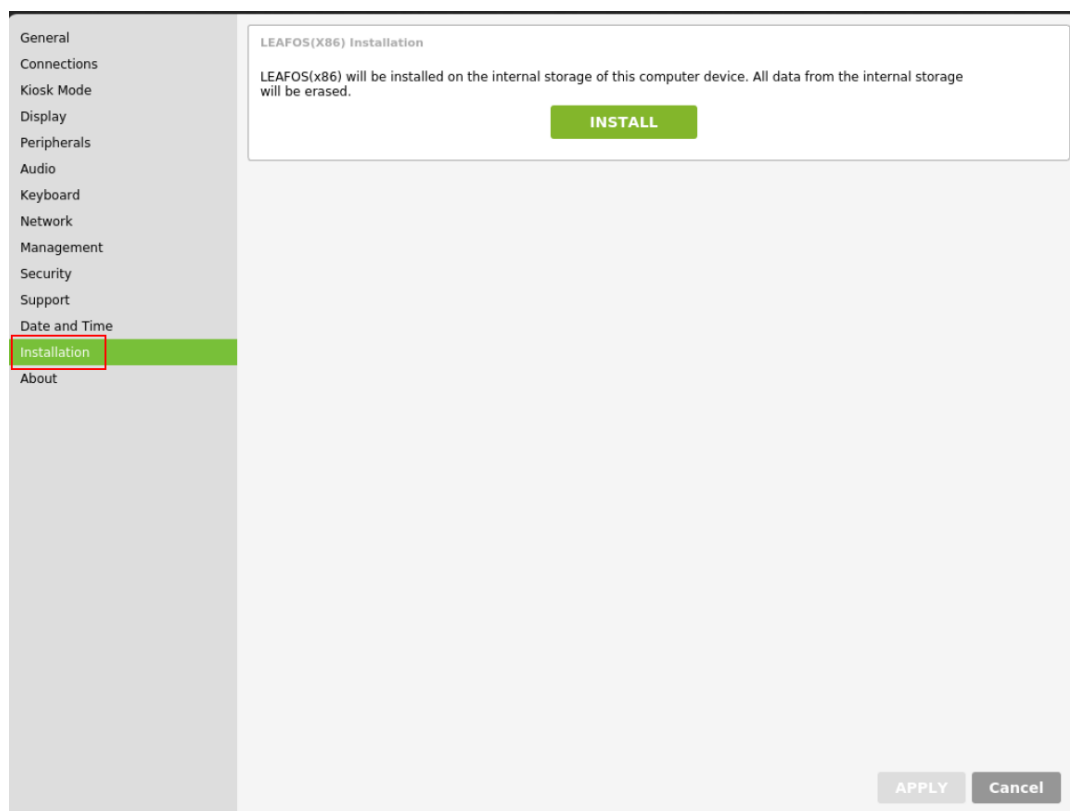
By default, your device will always live boot LEAF OS from the connected USB flash drive. There will be no changes to the PC/laptop's internal HDD.

1. Connect the x86-64 PC/laptop to Ethernet or WiFi network.
2. Connect the bootable USB memory stick (prepared according to the instructions above) to the PC or laptop and power it up. The PC or laptop will perform live boot to the connected LEAF OS memory stick. Please refer to '[LEAF OS Live Boot from USB flash Drive Guide](#)' document on how to perform USB live boot from LEAF OS on PCs/laptops across different manufacturers.
3. It may take 10-20 seconds to bring up the LEAF OS UI (similar to RX420(RDP) thin client) during the power up. Please be patient.
4. Once the LEAF OS UI is up, you will see the LEAF OS device activation window. Please move to step (2) below to activate the device.

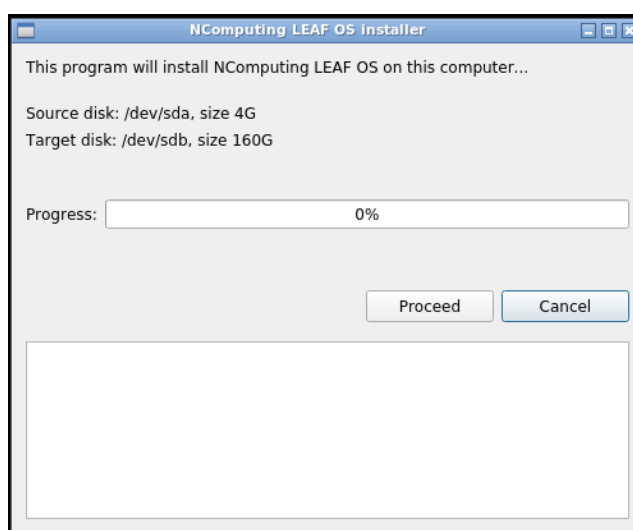
Installation option #2 (flash LEAF OS into HDD/SSD/eMMC/NVMe internal storage to boot from)

Your device's internal storage will be wiped and flashed with LEAF OS. When you boot the device, the LEAF OS will be directly booted from the internal HDD/SSD/eMMC/NVMe storage.

1. Follow the same procedures above to live boot LEAF OS on the device using the connected USB memory stick.
2. Once the LEAF OS UI is up, navigate to the '**Installation**' tab and click on 'Install' (see screenshot below). There are additional warning messages to inform the admin/user that the 'Install' process will erase the internal storage of the selected device.



3. Once you click on 'Install' and click 'OK' on the warning message, wait few seconds until the NComputing LEAF OS Installer window appears. It will prompt you to confirm to proceed flashing LEAF OS to the internal storage. Click the [Proceed] button to confirm and proceed. Once the HDD/SSD/eMMC/NVMe storage is flashed, you will be prompted to shut the PC/laptop down and reboot.



The installation process may take several minutes. Please wait until it is finished. Once the internal storage is flashed, you will be prompted to shut the PC/laptop down and reboot.

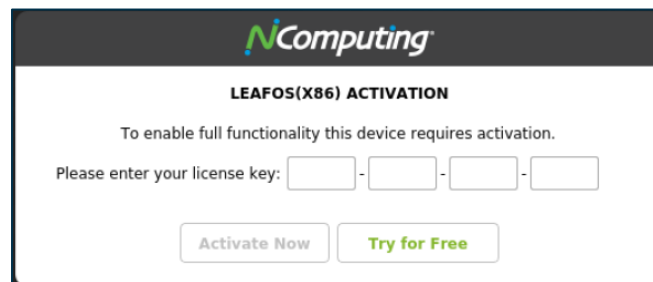
4. Remove the USB stick with LEAF OS installer and power up the computer again. LEAF OS will boot directly from the internal storage. Once the LEAF OS UI is up, you will see the LEAF OS device activation window. Please move to step (2) below to activate the device.

STEP (2) ACTIVATE LEAF OS SOFTWARE ENDPOINT

1. Once the LEAF OS device is boot up, you will see the following device activation window.

If you already have a valid LEAF OS license key, enter it (one time action) and click on '**Activate Now**'.

If you don't have a LEAF OS license, click on '**Try for Free**' to start the free trial. The free trial duration is subject to change. At the time of this writing, LEAF OS free trial is 7 days on 3rd party hardware and 60 days on NComputing EX500 thin client.



2. The device should be activated within seconds. Once the device is activated, you can connect to the selected desktop virtualization environment (e.g. Citrix, AVD, RDS, vSpace Pro, VERDE VDI) and start working.

STEP (3) SELECT THE 'AVD CLIENT' DEVICE OPERATION MODE

LEAF OS software endpoint can operate in several different modes. To select 'AVD Client' operation mode (previously known as 'WVD'), navigate to Settings -> General, select **AVD Client** and click 'Apply' to save.



STEP (4) CONFIGURE AVD CLIENT SETTINGS

Navigate to **Connections** tab and select your AVD deployment release version(s). LEAF OS endpoint supports and can deliver published resources from **Azure Commercial Cloud (Spring 2020, Fall 2019)**, **Azure Government Cloud** and **Windows 365**.

By default, **Spring 2020 and Windows 365** deployment is pre-selected. Make your selection and click 'Apply' to save and the corresponding AVD login UI will appear. Also by default, the device will re-use the Azure login credentials when launching AVD session.

General
Connections
Kiosk Mode
Display
Peripherals
Audio
Keyboard
Network
Management
Security
Support
Date and Time
Installation
Files
About

AZURE VIRTUAL DESKTOP CONNECTION SETTINGS

Enable support for Azure Virtual Desktop releases:

☐ Fall 2019
☒ Spring 2020 or Windows 365
☐ Azure Government

Custom parameters:

☐ Enable Local Applications

Desktop session placement: All screens

Desktop session window size: Fullscreen

☒ Re-use Azure credentials when launching AVD sessions

To access **Azure US Government Cloud** deployment, select the 'Azure Government' option:

General
Connections
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About

AZURE VIRTUAL DESKTOP CONNECTION SETTINGS

Enable support for Azure Virtual Desktop releases:

☐ Fall 2019
☐ Spring 2020 or Windows 365
☒ Azure Government

Custom parameters:

☐ Enable Local Applications

Desktop session placement: All screens

Desktop session window size: Fullscreen

☒ Re-use Azure credentials when launching AVD sessions

If the user credentials necessary for launching certain AVD RemoteApp program or desktop session are different than the Azure credentials, then the **Re-use Azure credentials when launching AVD sessions** option can be disabled. Please uncheck the default selection and click 'Apply' to save. If only the AVD session password is different than the Azure password, then the **Preset the AVD username to Azure username** option can be used for user's convenience. The username will be preset in the AVD logon window then and the user will only need to enter the password.

STEP (5) OPTIONAL - SETUP KIOSK MODE

This is an optional step. The **Kiosk Mode** settings allow the user to automatically login to his/her AVD account, and if required, automatically launch a specified Windows application or desktop. The username and domain name need to be specified separately here (instead of user@company.domain) for the automatic user login. The name of AVD resource to be automatically launched after (manual or automatic) user login can be specified as **Application** to auto-start. Click 'Apply' to save. Please note that MFA is not supported when 'Kiosk Mode' is enabled.

STEP (6) OPTIONAL - CONFIGURE PERIPHERAL DEVICE SETTINGS

Navigate to **Peripherals** tab to configure the redirection of peripheral devices. The optimum redirection settings are already pre-selected for all supported classes of peripheral in the 'Default' settings. The best behavior will be achieved when using the native (functional) redirection. For AVD sessions the native redirection is available for mass storage devices, audio devices, printers, webcams, and smart card readers.

Administrator can customize the settings and enable or disable redirection for selected classes of peripheral devices.

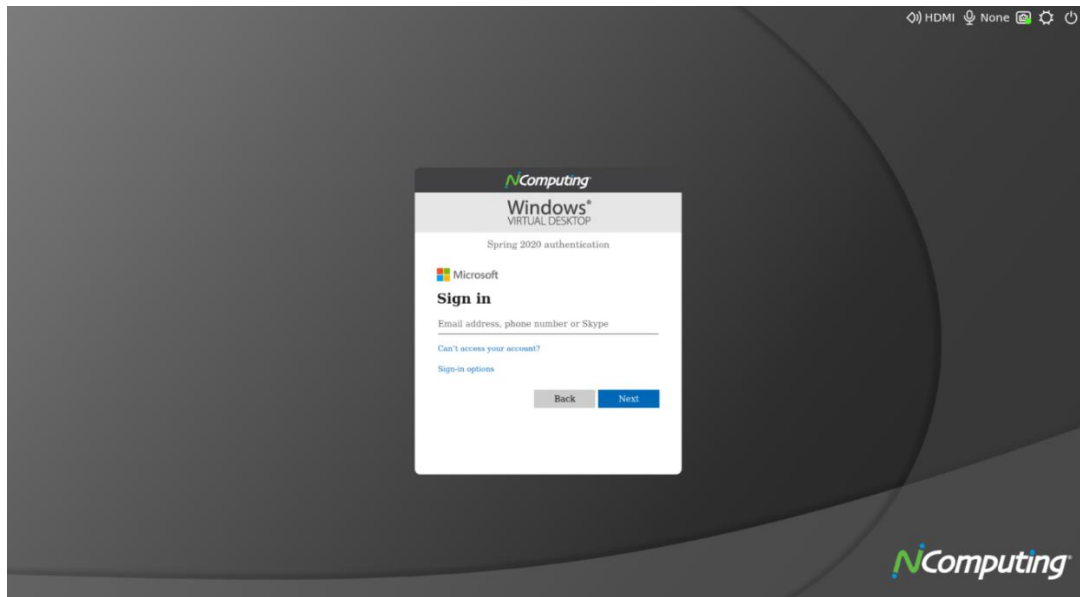
The native redirection of printers requires the printers to be defined locally on the thin client. USB and network (JetDirect) printers are supported. When adding USB printers, a USB printer identification string needs to be specified. It can be also pulled from the USB printer, if it is connected. This serves the purpose of identifying the different USB printers, when multiple USB printer will be connected. In case of single USB printer this field can be left empty. For each configured printer, the exact name of corresponding Windows printer driver must be specified. This driver must be installed on the AVD virtual machine for successful printer redirection.

Name	Type	Address/Identification	Windows printer driver name
HPDJ5520	USB	HP Deskjet 5520 series	HP Deskjet 5520 series
Printer2	Network (JetDirect)	10.0.0.7	Generic / Text Only
Samsung_M2020	Network (JetDirect)	10.0.0.8	Samsung M2020 Series

The first printer from the list will be configured as the default printer and will also become the default printer in the AVD session.

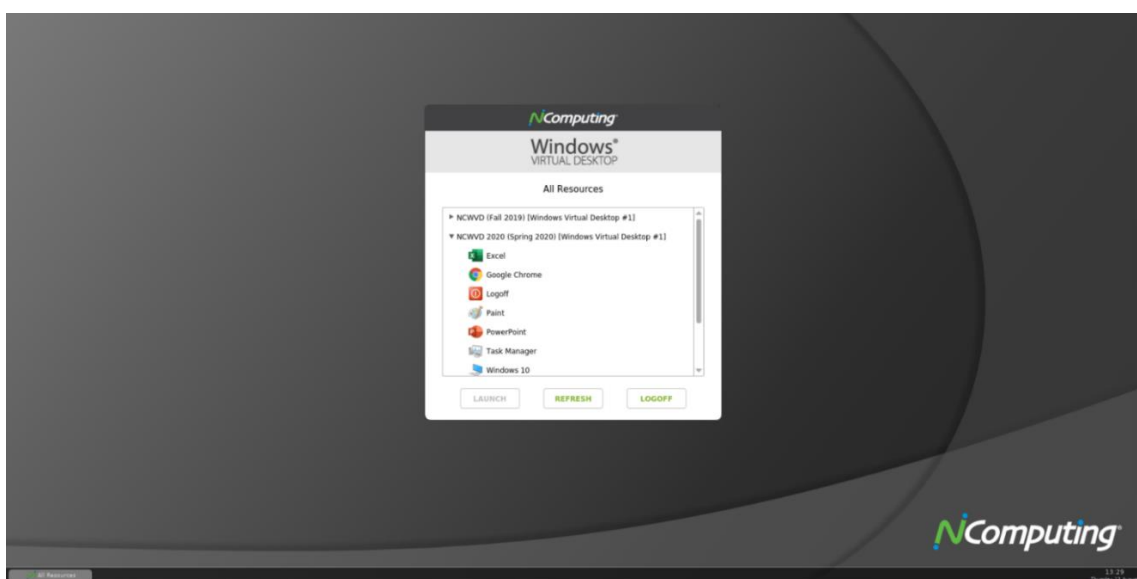
STEP (7) LOGIN TO AVD OR WINDOWS 365 ACCOUNT

If you did not setup 'Kiosk Mode' in step 4, you will need to manually enter your AVD or Windows 365 credentials in the 'AVD Client' login page. Multifactor Authentication (MFA) is also supported (e.g., SMS passcode, authenticator app).

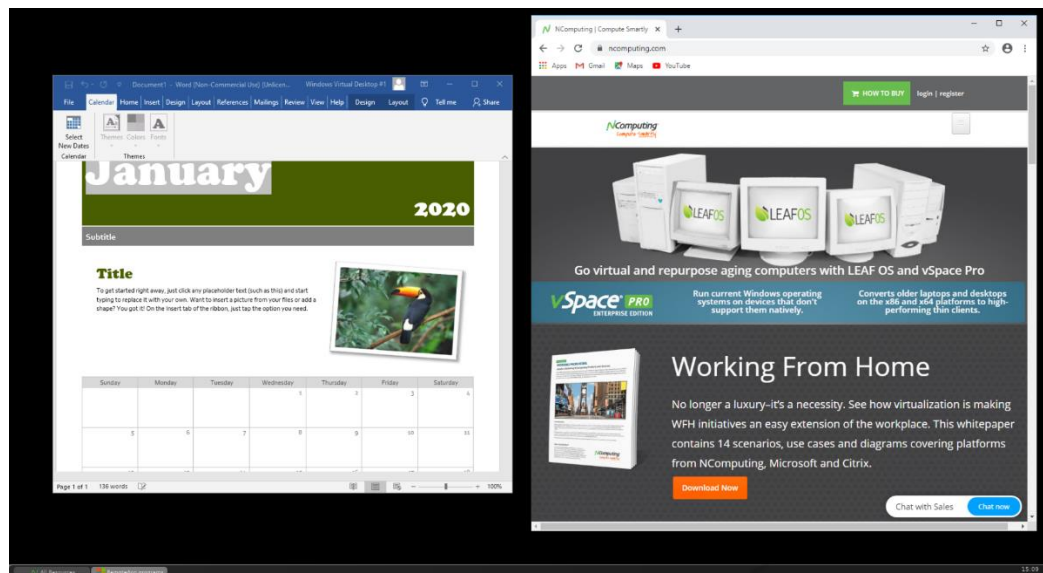


STEP (8) ACCESS AVD OR WINDOWS 365 PUBLISHED RESOURCES

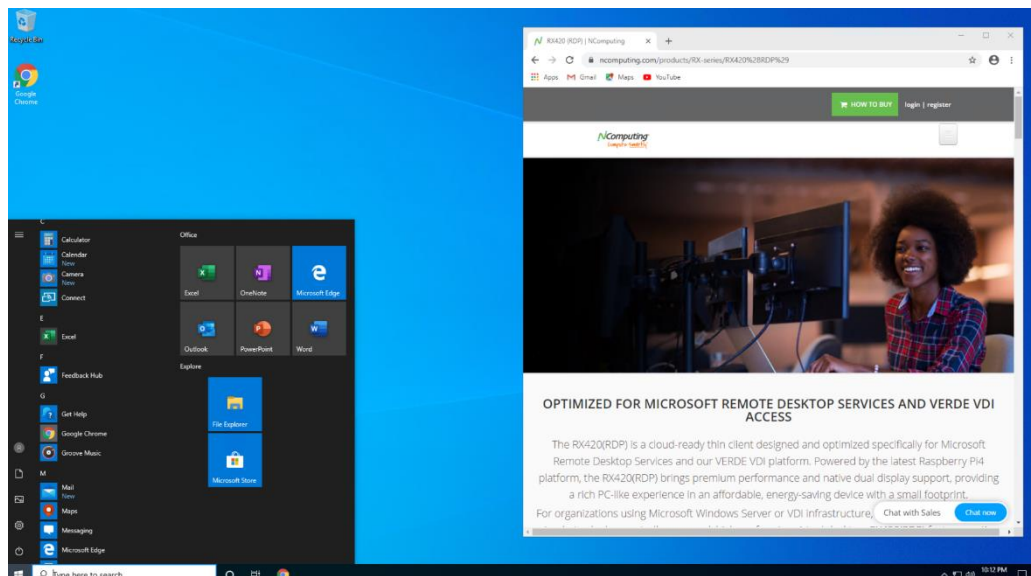
- After you login to the AVD or Windows 365 account, you will be presented with a list of AVD published resources, based on either Spring 2020 or Fall 2019 releases.
- You can expand or collapse the resource listing by clicking at the top-level category.
- Double-click on any RemoteApp or desktop icon to launch the resource.
- Use the integrated taskbar to manage multiple opened applications.



Example: launching multiple AVD RemoteApp programs



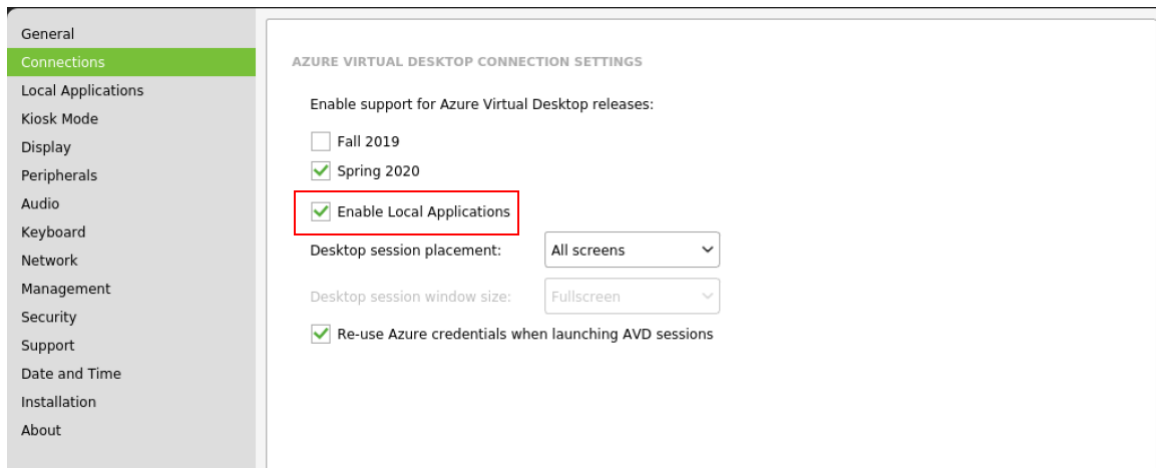
Example: launching full-screen AVD Remote Desktop



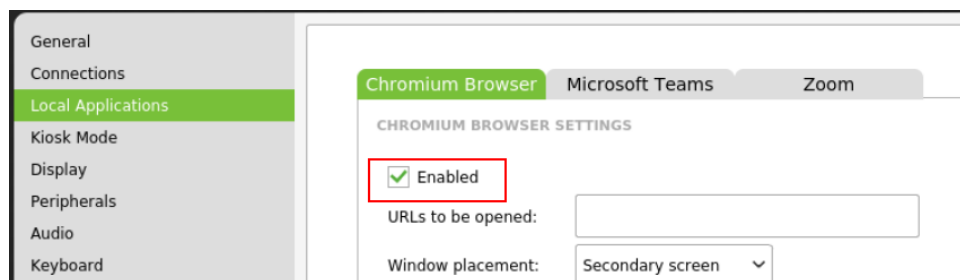
STEP (9) ACCESS LOCAL APPLICATIONS IN AVD SESSION

LEAF OS software endpoint allow users to multi-task between AVD sessions and the built-in local Chromium browser, Microsoft Teams and Zoom applications, providing added flexibility for direct access to unified communications (including video conferencing), web content and web apps without going through desktop virtualization.

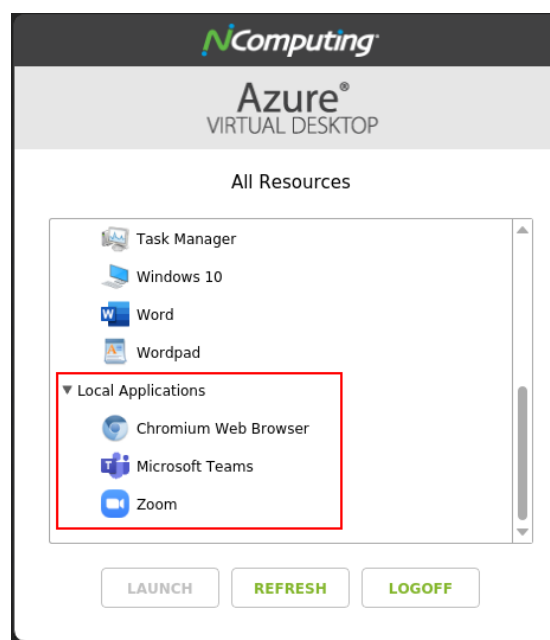
- To enable local applications in AVD or Windows 365 session, the admin first needs to 'Enable Local Applications' in the AVD 'Connections' setting menu.



- Navigate to the 'Local Applications' tab, the admin can selectively enable different local applications:



- Once the end-user logs in to his/her AVD or Windows 365 session, he/she will see the "Chromium" web browser listing among the AVD all resources listing.

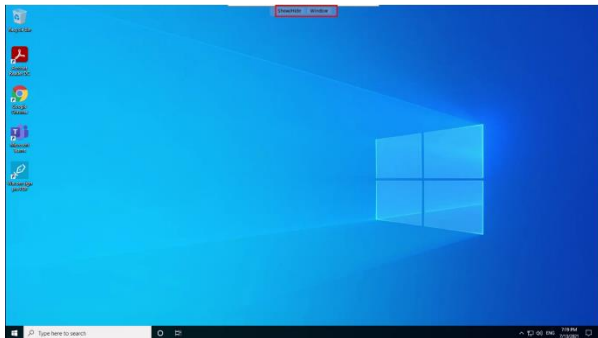


STEP (10) TIPS: MULTI-TASKING IN AVD OR WINDOWS 365 SESSION

- From the AVD or Windows 365 session, the user can launch multiple RemoteApps or RemoteDesktops. If the user launches RemoteDesktop, it will be displayed in full-screen by default. The user can switch

from full-screen desktop to 'windowed' desktop display to allow for multi-tasking. To switch from full-screen AVD desktop to 'windowed' AVD desktop, simply hover the mouse cursor to the top center and click on 'window' soft icon.

Fullscreen mode



Hover mouse cursor to top center. Click on 'window'.

Show/Hide Window

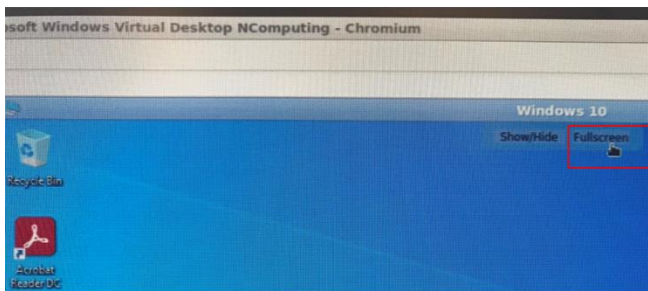


Windowed mode



- To switch from 'windowed' AVD RemoteDesktop to full-screen mode, click on the 'Full screen' icon at the top-center of the desktop.

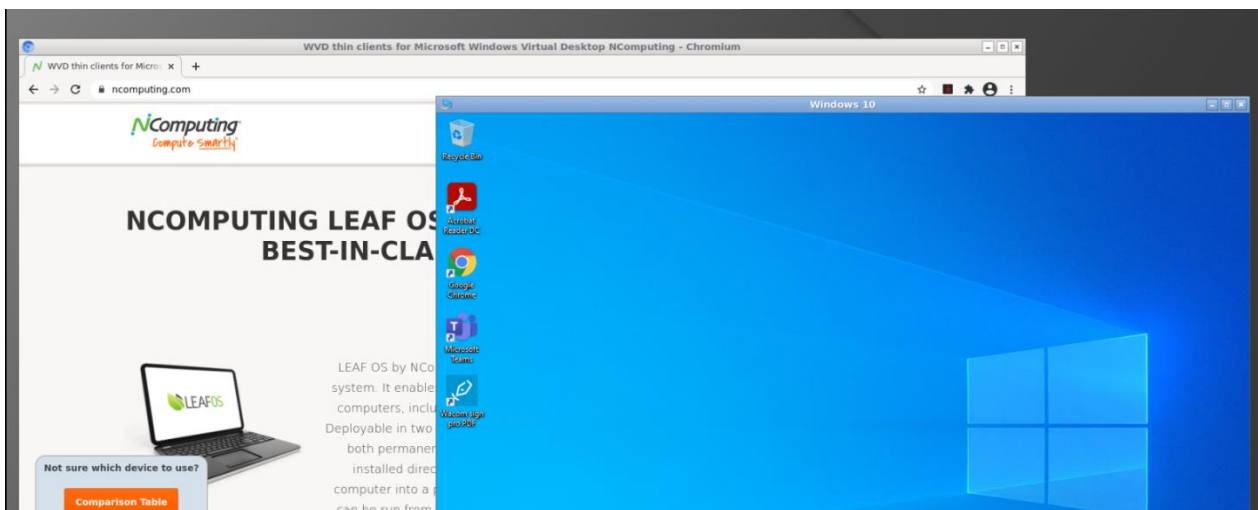
Windowed mode



Click on 'Fullscreen' icon



- Once the RemoteDesktop is in 'windowed' display mode, the user would be able to multi-task with local 'Chromium' browser (e.g. access side-by-side, minimize, maximize and move windows).



Additional resources:

LEAF OS software endpoint and RX420(RDP) User Configuration Guide:

LEAF OS and RX420(RDP) is easy-to-use and provision. For users who want to learn how to use advanced features and/or customizations, please refer to the LEAF OS and RX420(RDP) User and Configuration Guide:

<https://ncomputing.box.com/shared/static/310pp20tfhh4aqc6x4nj14sxch52q360.pdf>

PMC Endpoint Manager Quick Start Guide:

NComputing PMC is an endpoint management system designed and developed to remotely manage NComputing access devices.

Please refer to the PMC Quick Start Guide:

<https://support.ncomputing.com/portal/en/kb/articles/pmc-2-5-0-quick-start-guide>

Key features for PMC include:

- Ability to manage devices located in local- and wide-area networks, devices located behind firewalls and NAT-routers, including devices of work-from-home users.
- Ability to edit configuration of selected devices and to push configurations to multiple devices (through device profiles).
- Ability to securely shadow all manage devices' screens.
- Ability to request and collect troubleshooting information from managed devices.
- Ability to schedule device firmware updates.
- Readiness to support future device families, models, and configuration versions by uploading configuration definition files.
- Hosting files (firmware, certificates, wallpapers) for managed devices.
- Deployment as virtual appliance compatible with industry-standard hypervisors and Azure Cloud.
- Easy to use web-based user interface, accessible from any network location.
- Dashboard view with auto-refreshing summary information.
- Detailed event logging with filtering capability.
- Ability to export the contents of all PMC lists.
- Ability to mark selected devices as lost or found.
- Ability to revoke LEAF OS licenses.

CONTACTING TECHNICAL SUPPORT AND ADDITIONAL RESOURCES

For Microsoft AVD or Windows 365 related questions or feedback, please visit [NComputing knowledge base](#) or [NComputing support page](#).

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