Network Station Manager Version 2

Windows Applications Servers

Network Station Education
IBM NCD
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Objectives

- **Understand what Windows Applications Servers are**
  - WinFrame
  - WinCenter
  - Windows Terminal Server Edition
  - MetaFrame
  - Unix Integration Services (UIS)
- **Understand what protocols are used to connect to these servers**
  - Remote Desktop Protocol (RDP)
  - Independent Computing Architecture (ICA)
  - X11

Notes

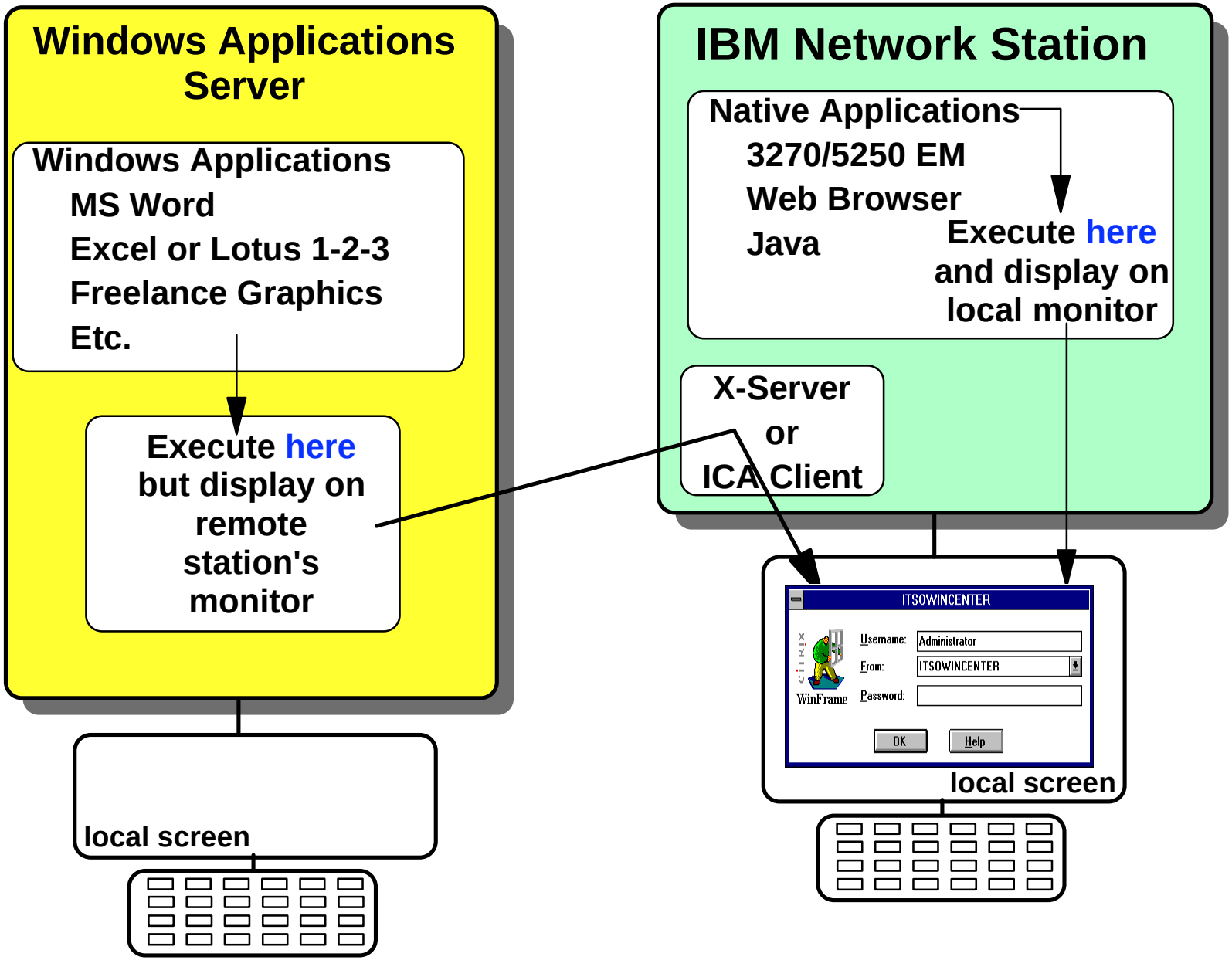
The topic of this presentation is Windows Applications Servers.

This objective of this topic is to provide an overview of Windows applications servers.

This is meant for those who are new to Windows applications servers and need a high level overview of the terminology, the products and the functions that these products provide.

One also needs to understand the different protocols that can be used to connect clients to Windows applications servers.

What are Windows Applications Servers?



Notes

The typical PC running a version of Microsoft Windows such as Windows NT server 3.51 or Windows NT Server 4.0 is usually a single user system. These server systems are used to share resources such as files and printers and these resources can be accessed by many remote clients simultaneously, but there are not multiple users simultaneously executing applications on those servers.

There are however versions available that can turn a Windows NT server into a multi-user system such that multiple users can be simultaneously logged on to the server and execute applications on the server itself. This multi-user facility allows remote clients (which are usually thin clients, but do not have to be) to use their keyboard, mouse and display as remote devices and actually execute an application on the server itself (as opposed to on the client) and have the output redirected to their display.

In other words, instead of having to use the local console on the server to execute applications, these applications are executed from the keyboard, mouse and display of the remote clients. Each client logging in to the server receives a Windows desktop on its display and has the illusion of being the only user of the system.

This allows a thin client such as a Network Station, which may not have the engine, and resources necessary to execute full blown Windows applications locally to actually execute these applications on a remote server. Even PCs who could execute these applications locally but do not have the required engine power (such as an old 386 processor) or the required local storage capability may take advantage of executing on a remote server by using a client that allows them to redirect the output of these applications to their I/O devices.

Products/Manufacturers

WinFrame

- **Windows NT Server 3.51 (from Microsoft)**
  - Normal Base Windows NT server system
- **WinFrame 1.x (from Citrix)**
  - Adds multi-user support to the base Windows NT 3.51
  - Provides ICA as connection protocol
- **WinCenter (from NCD)**
  - Adds X11 as connection protocol to WinFrame

MetaFrame

- **Windows NT Server 4.0 - Terminal Server Edition (WTSE) (from Microsoft)**
  - Base Windows NT 4.0 server including multi-user support
  - Includes RDP as connection protocol
- **MetaFrame (from Citrix)**
  - Product from Citrix Inc.
  - Adds ICA connection protocol to WTSE
- **Unix Integration Services (from NCD)**
  - Adds X11 connection protocol to MetaFrame

Notes

This Windows NT server multi-user environment has been evolving over the past few years and there are many products and manufacturers involved in providing this environment.

Let talk about what we usually refer to as the WinFrame environment.

- The base for that environment is Microsoft's Windows NT server 3.51.
- Citrix have obtained the right from Microsoft to use the base WIndows NT server 3.51 system and add to it a multi-user capability which is called WinFrame. Citrix provides, as part of WinFrame, the ICA protocol which is used by remote clients to connect into the Winframe system.
- In addition, NCD also has developed a product called WinCenter which adds to the Winframe product the ability to have clients use the X11 protocol to connect into the WinFrame system.

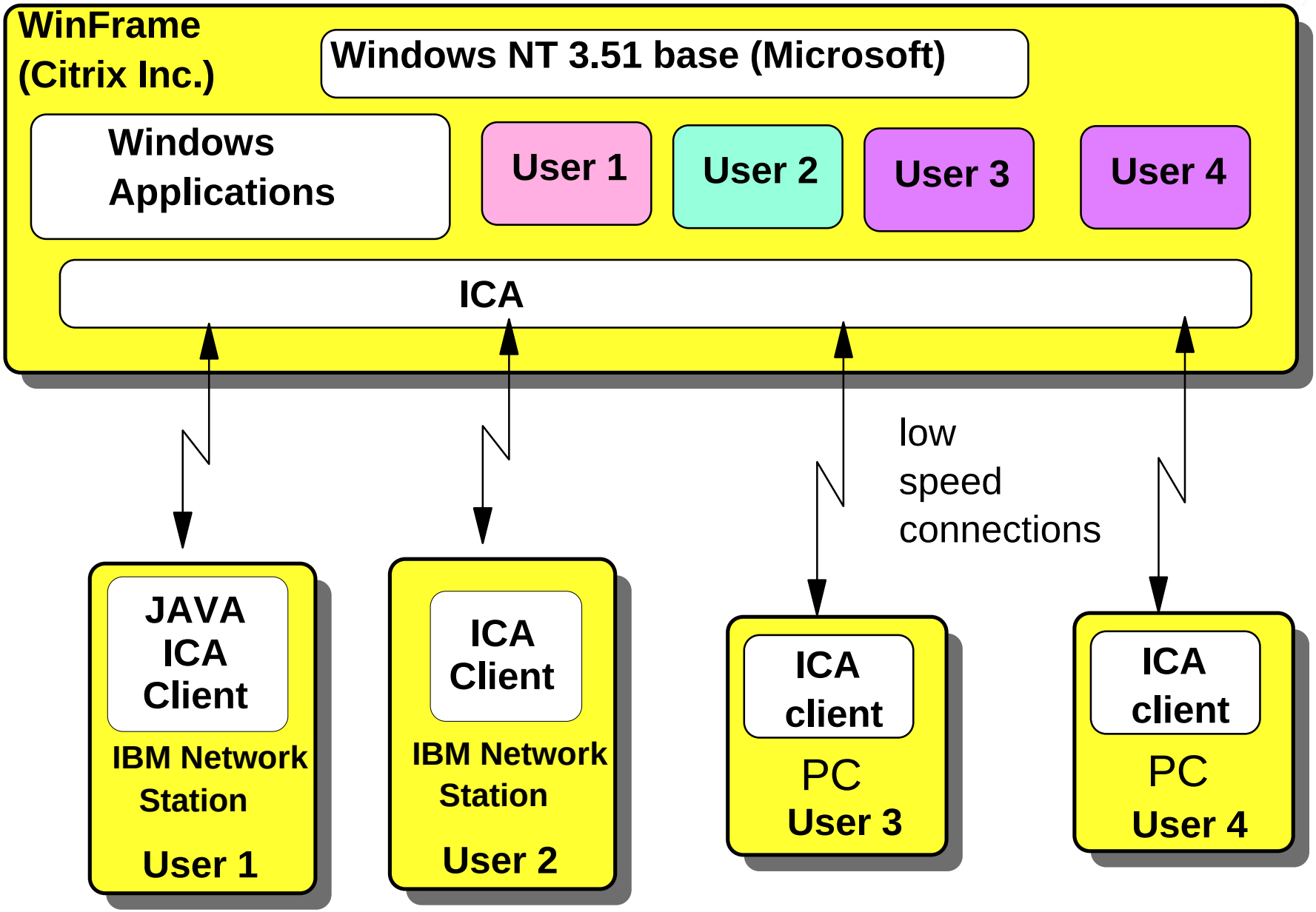
In other words, when talking about a WinFrame system, we are talking about a Windows NT 3.51 type of system with multi-user capability.

For the Windows NT server 4.0 environment:

- Microsoft has actually built (work performed by Citrix) into its product the multi-user capability and called it Windows NT Server 4.0 - Terminal Server Edition, abbreviated WTSE. THis gives the base Windows NT server 4.0 system a multi user capability that lets WIndows terminals connect in using a protocol called Remote Display Protocol (RDP).
- Citrix has then developed a product called MetaFrame which adds the ICA protocol to WTSE so that clients other than Windows terminals can connect using ICA. There are a few versions of this product that we will explain in a moment.
- Finally, NCD followed with the Unix Integration Services product to allows clients using the X11 protocol to connect into the MetaFrame server.

In other words, when talking about a MetaFrame system we are talking about a Windows NT Server 4.0 type of system with multi-user capabilities.

What is WinFrame?

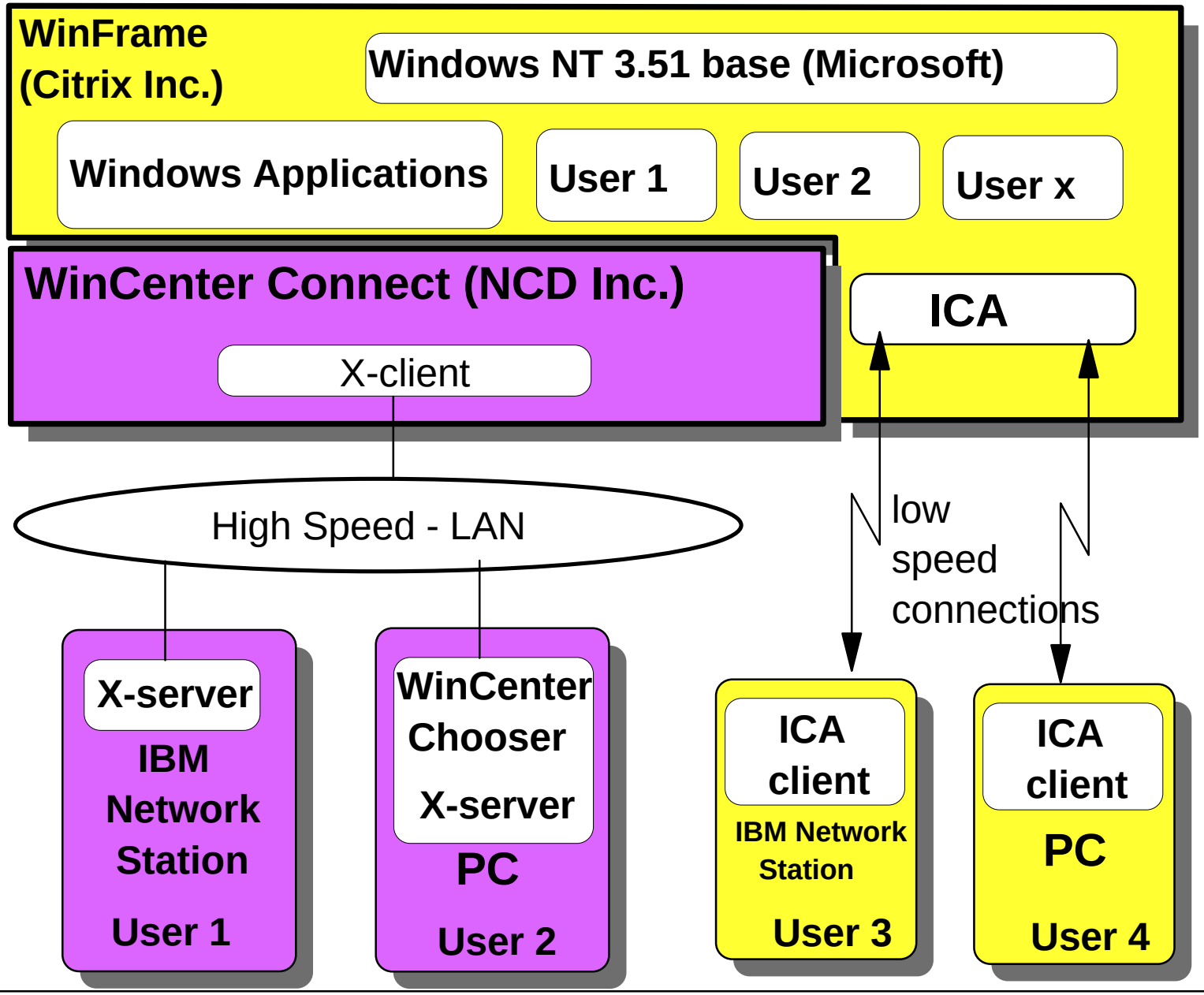


Notes

This chart describes a WinFrame environment.

- The base of the system is Microsoft's WIndows NT Server 3.51 code.
- Citrix has added a multi-user function to the base system so that many users can connect into the server and simultaneously execute Windows applications.
- The connection between the clients and the server uses a protocol from Citrix called Independent Computing Architecture (ICA) which was originally designed to maximize the transfer of data over low speed connections.
- Clients that want to connect into the WinFrame server therefore run a client called the ICA client that can execute on either PCs on many different platforms or on thin clients such as the IBM Network Station.
- Initially, the IBM Network Station did not have a native ICA client but it was able to run the Java ICA client. Today, the Network Station does have a native ICA client that can connect to any ICA-based server.

What is WinCenter Connect?



Notes

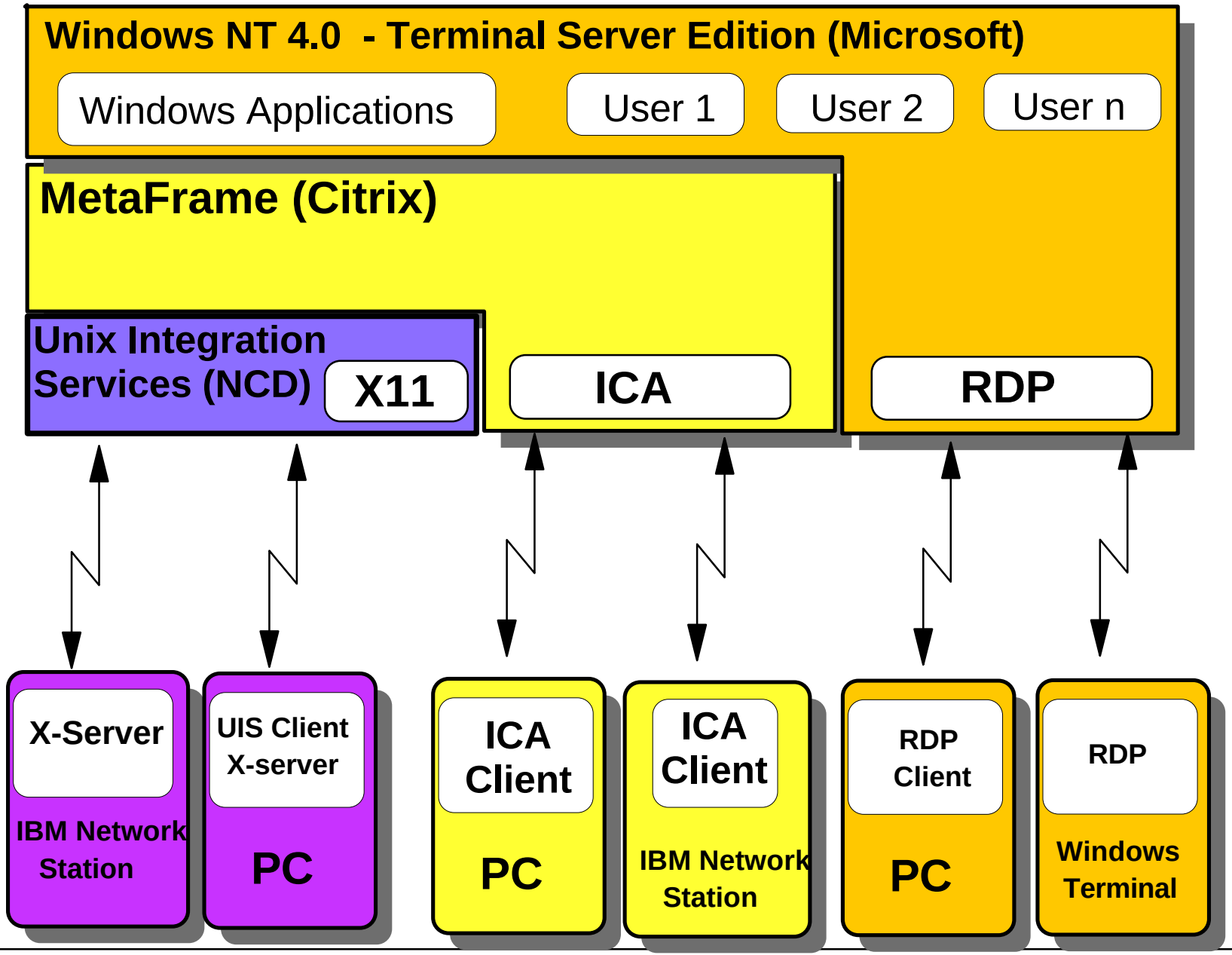
WinCenter Connect is a product from NCD Inc. that allows clients that function as X terminals to connect into a WinFrame server. In other words, client that want to use the X11 protocol instead of the ICA protocol require the presence of the WinCenter Connect product to connect into the WinFrame server.

Essentially, the WinCenter product acts as the X-client that communicates with the X-server on the remote client (confusing terminology when talking about X windows).

The IBM Network Station is, by design, an X-terminal which allows it to use the X11 protocol natively. Other platforms, such as any PC for example, also have the capability to run a Wincenter Chooser product that allows the PC to function as an X-server and connect to WinCenter Connect.

The diagram indicates that high speed LAN connection are used with the X11 protocol because it was initially designed to function over a LAN as opposed to the ICA protocol that can function well on either slow or high speed connections.

What is WTSE/MetaFrame/UIS?



Notes

Moving on to the Windows NT Server 4.0 environment, we now have a different set of products to deal with.

In this case, the base system is Microsoft's Windows NT 4.0 - Terminal Server Edition, which is a modified Windows NT Server 4.0 system to which the multi-user capability has been added in order to support WIndowsw Terminals (hence the name Terminal Server Edition).

As shown on the right hand side of the diagram, the base protocol used to communicate between the server and its clients is the Remote Display Protocol (RDP) which is part of the base WTSE product.

In order to use the ICA protocol, which has a lot more functionality than the RDP protocol, the MetaFrame product from Citrix must be added to Microsoft's WTSE product.

And, if the X11 protocol is the protocol required, then the Unix Integration Services product from NCD must also be added to the MetaFrame product.

The types of clients that can now connect to a WTSE server are as follows:

- Windows Terminals use the base RDP protocol.
- Any PC can also install the Terminal Server Client code and use the RDP protocol
- PC can also install the ICA client and/or the UIS client ad communicate using the ICA or the X11 protocols.
- Network Station have a native ICA client or they can function as an X-terminal to use the X11 protocol.

Connecting to WinFrame or MetaFrame

- **Connect using Remote Desktop Protocol (RDP)**
  - Used by Windows Terminals or RDP clients on W95/NT/WFW
  - Note: This method is not supported by the IBM Network Station
- **Connect Using ICA**
  - Windows-Based Application (manual or autostarted)
  - ICA Remote Application Manager (user can choose amongst multiple target servers)
  - Kiosk Mode (which is actually a Windows-based application that is autostarted)
- **Connect Using X11**
  - Use a Remote Program Menu Item
    - Using the X11 command (new with UIS)
    - Using the WinCenter command (was used with WinCenter)

Notes

In summary, the different connection mechanisms that can be used to connect to a WTSE server are as follows:

- Using the RDP Protocol
  - This is used by Windows Terminals or RDP clients installed on either Windows 95, Windows NT or Windows for Workgroup platforms.
  - Note that the Network Station does NOT support the RDP protocol.
- Using the ICA protocol
  - This is the most popular method and the one that has the most functionality.
  - In the case of the Network Station, there are three ways to use the ICA protocol
    - Define a Windows-Based application session with a specific target server
    - Define multiple connections in the ICA remote application manager to let the user choose which one he requires
    - Operate the station in kiosk mode with a specific server as the target server
- Using the X11 protocol
  - Configure a remote program session that can use either the X11 command or the WinCenter command

Examples of how to configure these different sessions are provided in the ICA topic.

Levels of MetaFrame Servers

The Metaframe product is available in different levels of functionality:

- **Citrix Devices Services (CDS)**
  - Inexpensive version of MetaFrame
  - Provides basic ICA connectivity, printing and COM support
  - No load balancing, audio support or session shadowing
- **MetaFrame for Terminals**
  - Designed to host only Windows-based terminals, which includes Network Stations
  - Supports all MetaFrame features/functions
  - Less expensive than the Enterprise version
- **MetaFrame Enterprise**
  - Full version of MetaFrame
  - Supports all types of clients

Notes

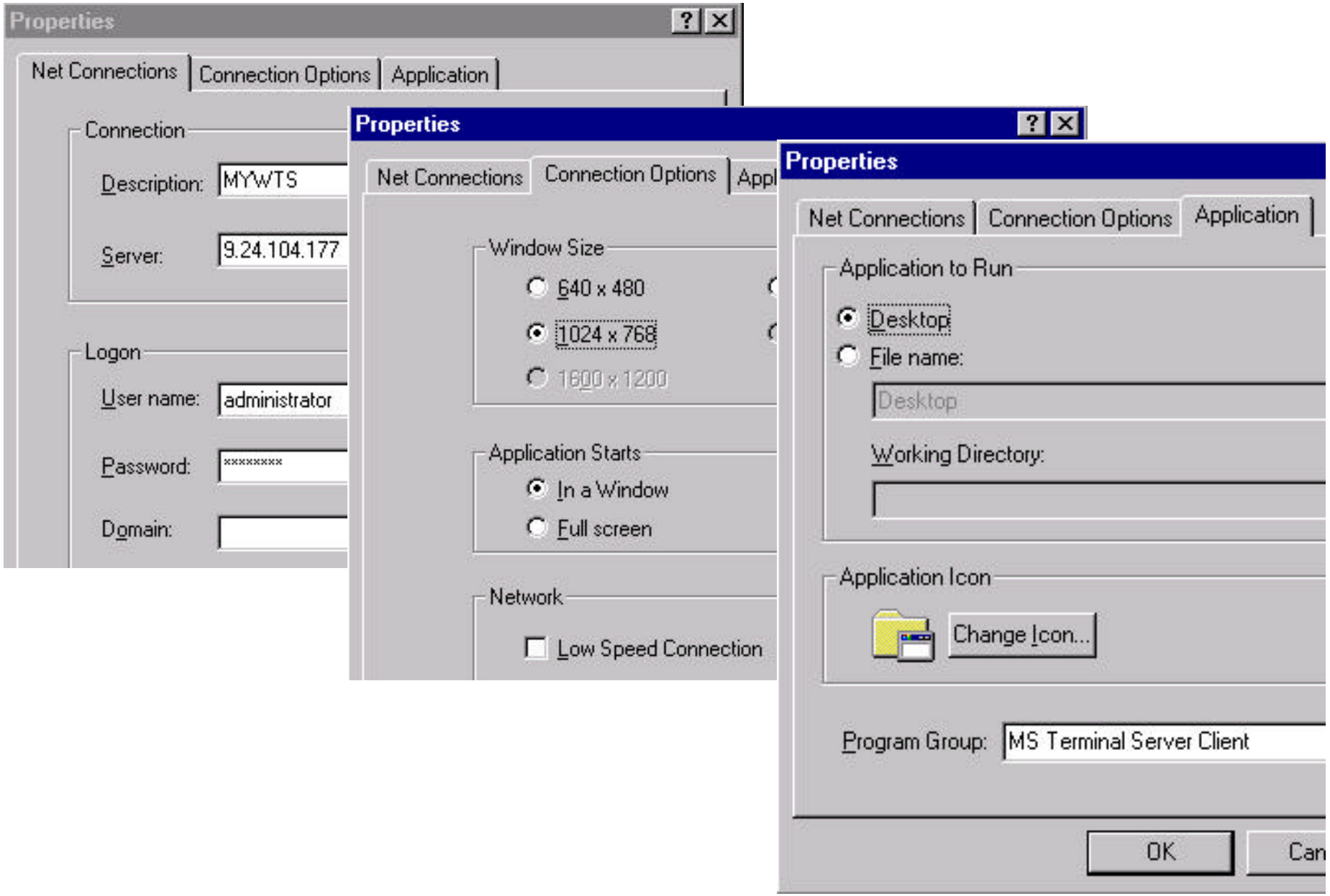
There are multiple levels or versions of the MetaFrame product that can be installed on top of the base WTSE system.

The Citrix Devices Services (CDS) is the least expensive of the MetaFrame versions and it is designed to provide only basic ICA connectivity functions, including printing and COM support. It does not provide features such as load balancing, audio support or session shadowing.

The MetaFrame for Terminals version is less expensive than the Metaframe Enterprise version. It does provide the full functionality of MetaFrame but will accept connections only from Windows-based (which includes the Network Station).

The MetaFrame Enterprise version is the most expensive and allows connections from any type of client.

RDP Client Example



Notes

Even though the Network Station does not support the RDP protocol, it might be useful, when setting up a WTSE environment, to be able to use the RDP protocol from a PC when doing some system programming work.

The panels illustrated here shows how the RDP client looks like on a PC, and users familiar with the ICA client will recognize some of the same fields.

The panel on the left identifies a specific server to go to, which can be identified as an IP address or an IP host name. As an option, the user name and password can be specified here to provide an automatic logon instead of the user having to be prompted with the normal Windows NT user logon panel.

The panel in the center defines the connection options such as the window size (resolution) and whether you want to start in windowed mode or full screen mode.

The panel on the right specifies whether you want the normal Windows desktop to be displayed initially or whether you want to launch a particular application immediately.

ICA Features

- User Logon Parameters
- Published applications
- Load balancing
- Shadowing
- Client drive, printer, COM port and audio mapping
- Color Support
- Video resolution
- Cut and Paste (Text)
- Encryption
- Data Compression
- Bitmap caching

Notes

Here are the main features provided by the ICA protocol:

- User logon parameters lets you configure an ICA session and pre-specify the user name, password and domain name so that the user does not need to be prompted every time he starts the session.
- Published applications lets you
- Load balancing lets you connect to a server farm and have the system determine which server the session should use at the time the session is requested
- Shadowing allows an administrator to display on his monitor whatever is displayed on any client's monitor, and vice-versa.
- Client device mapping (drive, printer, COM port and audio) lets a Windows application on the server communicate with the device through the ICA session itself.
- Color support allows the client to use either 16 or 256 colors
- Video resolution allows to set the ICA client's window size to fullscreen, a set of 4 predetermined sizes or a custom size.
- Cut and Paste allows exchange of text (only) between the Windows application running in the ICA client window and other windows on the Network Station's desktop.
- Five levels of encryption are available for the data passing between the client and the server
- Data compression and bitmap caching are techniques to enhance the performance on slow speed links at the expense of doing more processing on the client.

Where to Go for More Information

- **Redbook - SG24-5221 - NSM R3 Guide for Windows NT**
- **Redbook - SG24-5844 - NSM V2R1 Guide**

- **Citrix Documentation**
  - online help
  - Citrix MetaFrame Administrator's Guide
  - Citrix MetaFrame ICA Client User's Guide
- **UIS Documentation**
  - online help
  - Unix Integration Services Administrator's Guide
- **Citrix Web site (http://www.citrix.com)**
- **NCD Web Site (htp://www.ncd.com)**

Notes

These are some of the publications and web sites where additional information can be obtained.