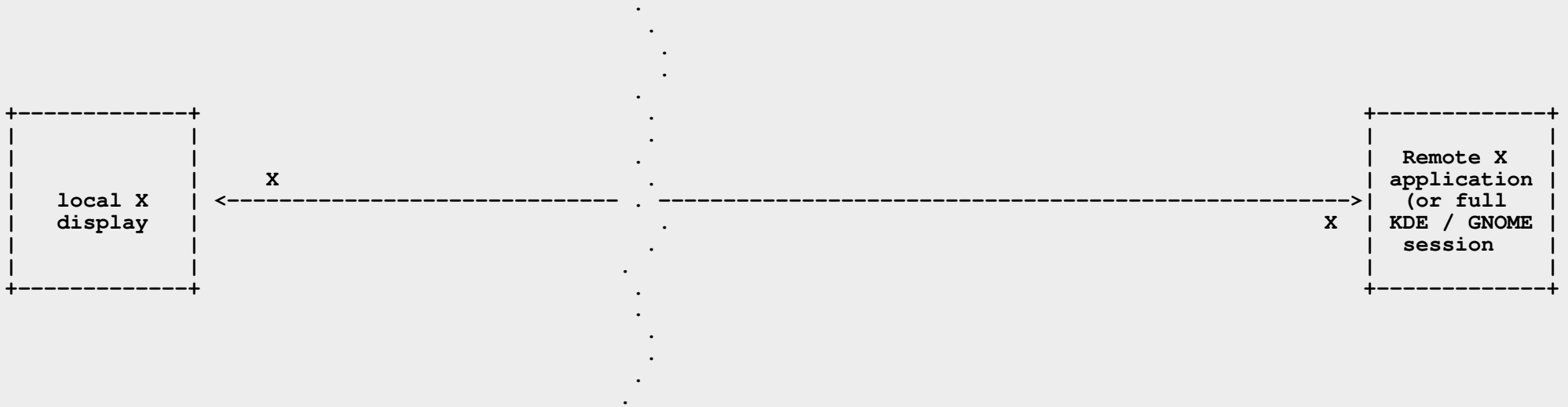


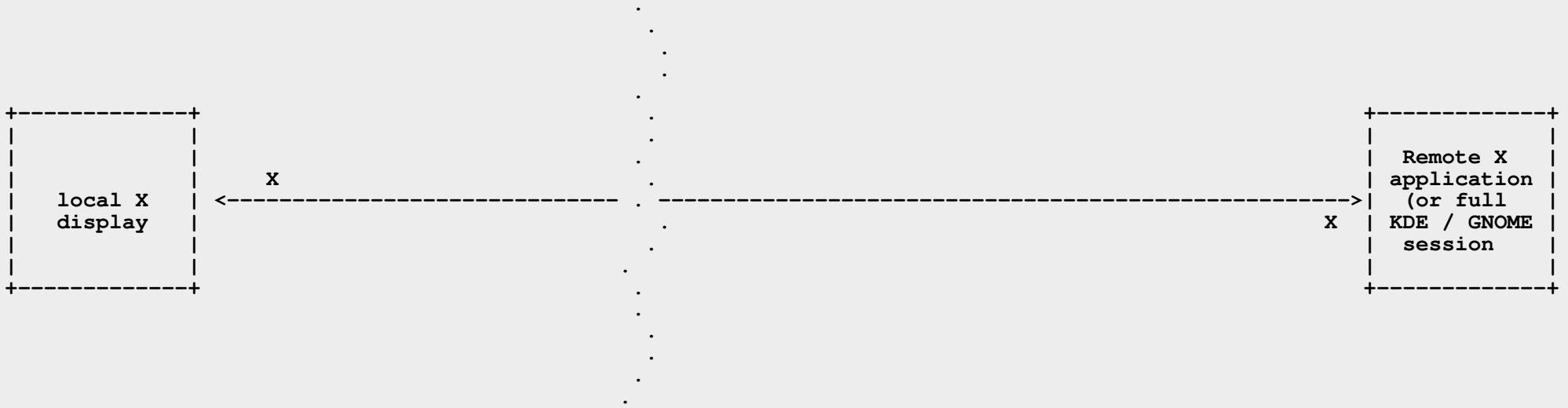


The next stage in desktop network computing...

Plain Vanilla X Flowchart

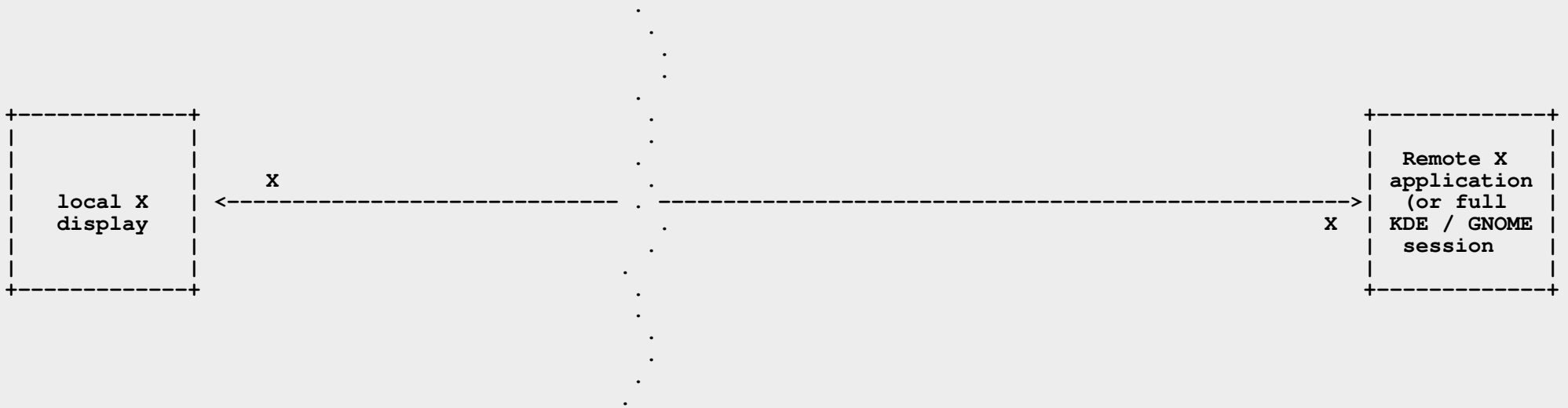


Plain Vanilla X Flowchart



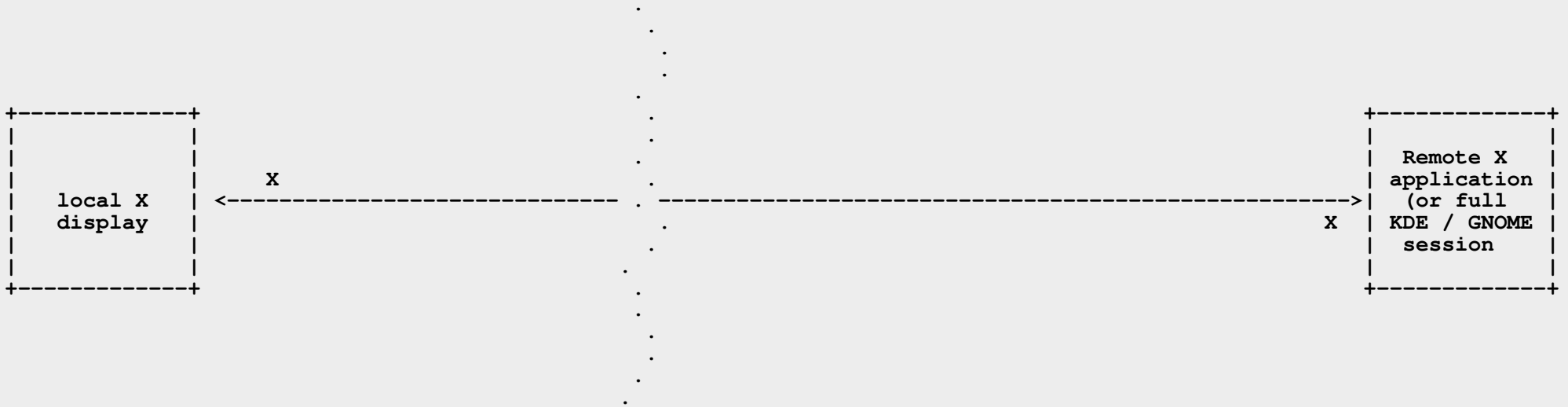
Often executed via `"ssh -X ..."`

Plain Vanilla X Flowchart



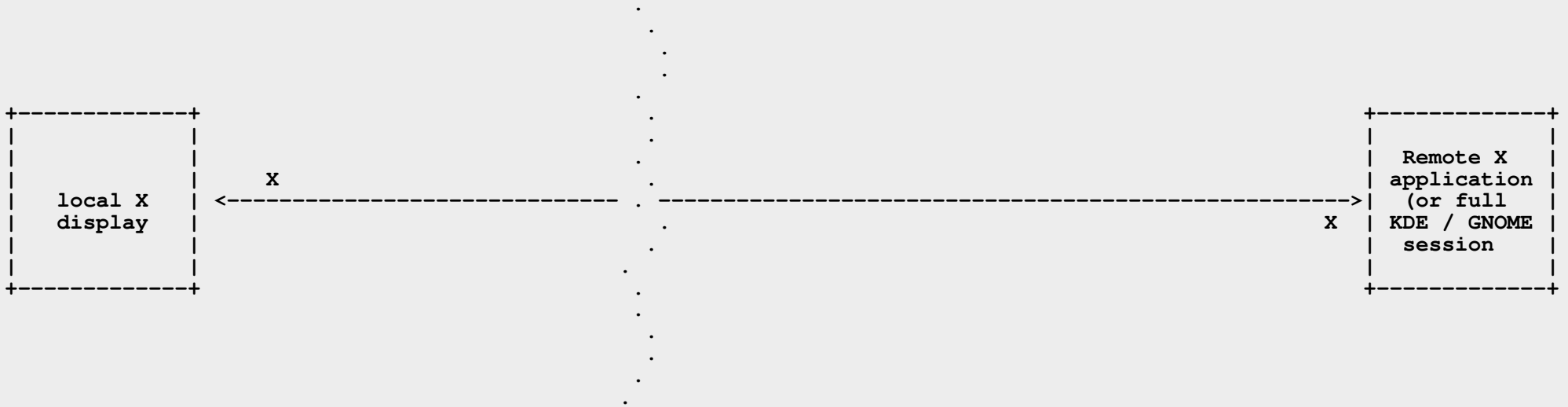
Often executed via `"ssh -X ..."`
With (some) compression: `"ssh -X -C ..."`

Plain Vanilla X Flowchart



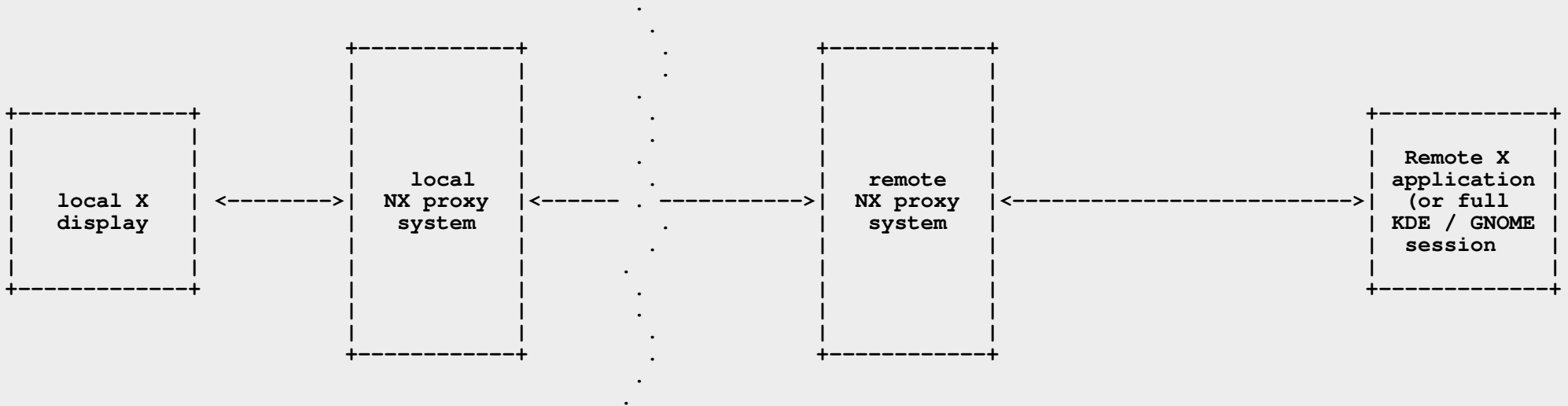
Often executed via "ssh -X ..."
With (some) compression: "ssh -X -C ..."
Works (quite) well over LAN

Plain Vanilla X Flowchart



Often executed via `"ssh -X ..."`
With (some) compression: `"ssh -X -C ..."`
Works (quite) well over LAN
Sucks over Internet or Low Bandwidth Connections

NX Flowchart: the "Proxies"



NX plugs two proxying systems into the connection

Local and remote proxies are basically the same

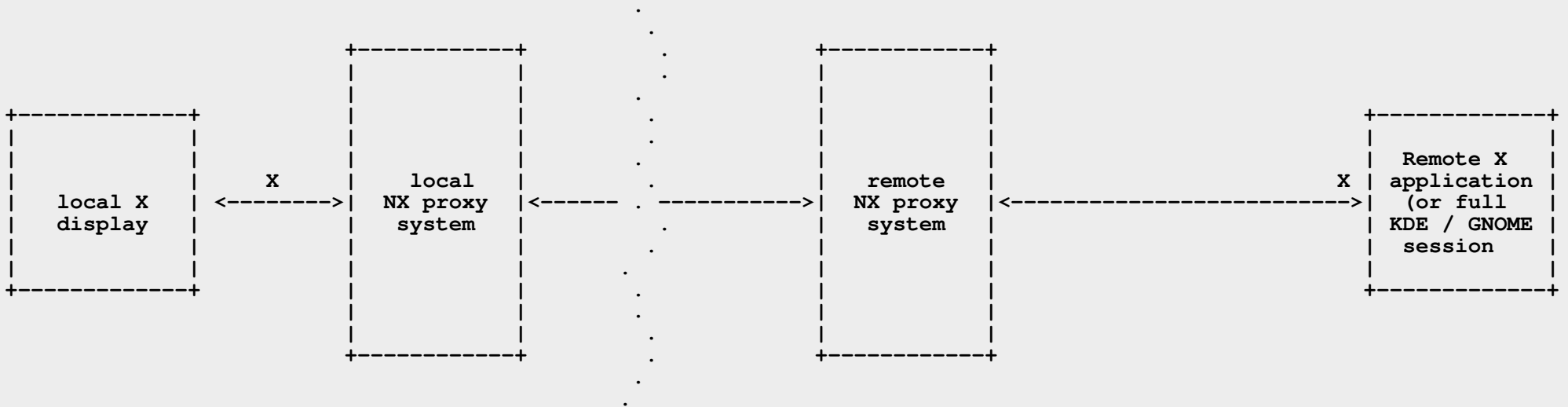
What is low bandwidth?

--> *Not* ADSL (like some of our American friends tend to assume)

--> But *ISDN* or *Modem* (even *GSM Modem* with only 9.600 Baud....)

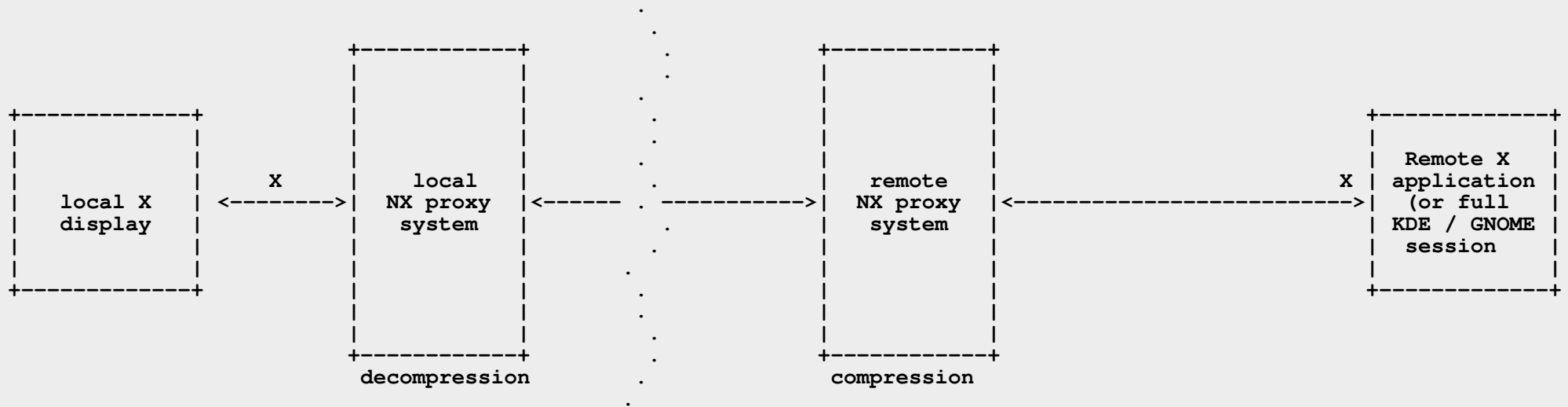
NX proxying system consists of compression libraries, nxproxy and nxagent programs

NX Flowchart: Proxies run "X" on each side



Both proxy systems talk "X" to their respective local endpoints
Remote proxy system pretends to be the X server to the remote application
(so no change is required for remote application)
Local proxy system includes an X server (for Windows) or uses another local one

NX Flowchart: Proxies compress/decompress traffic in between them

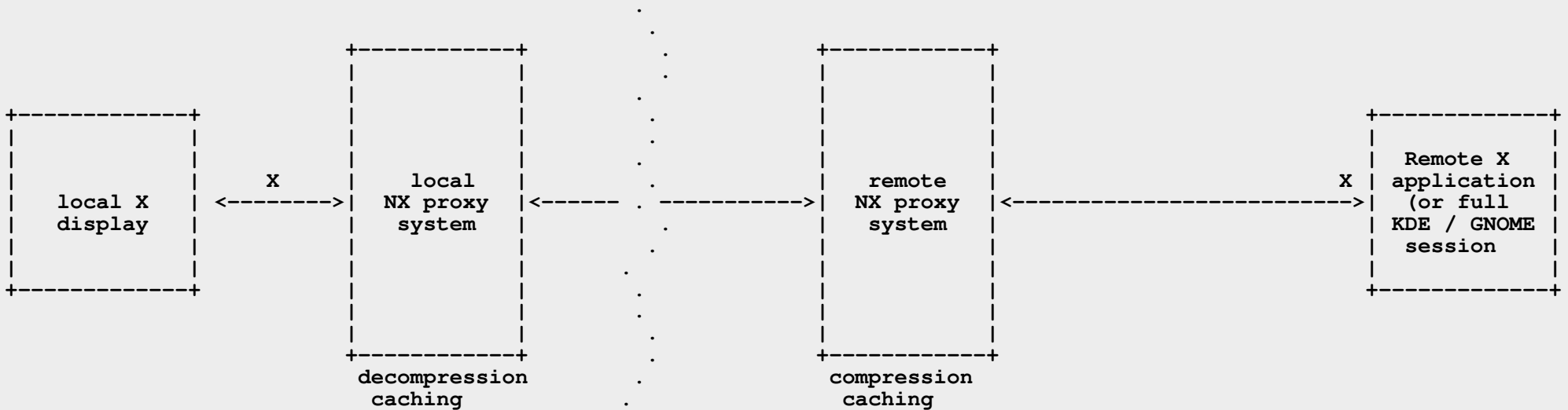


Compression/decompression:
=====

Remote proxy system compresses all traffic
Local proxy system decompresses all traffic

(...and vice versa)

NX Flowchart: Proxies cache traffic and keep cache in sync



Caching:

=====

Remote proxy system caches most traffic

Local proxy system caches most traffic

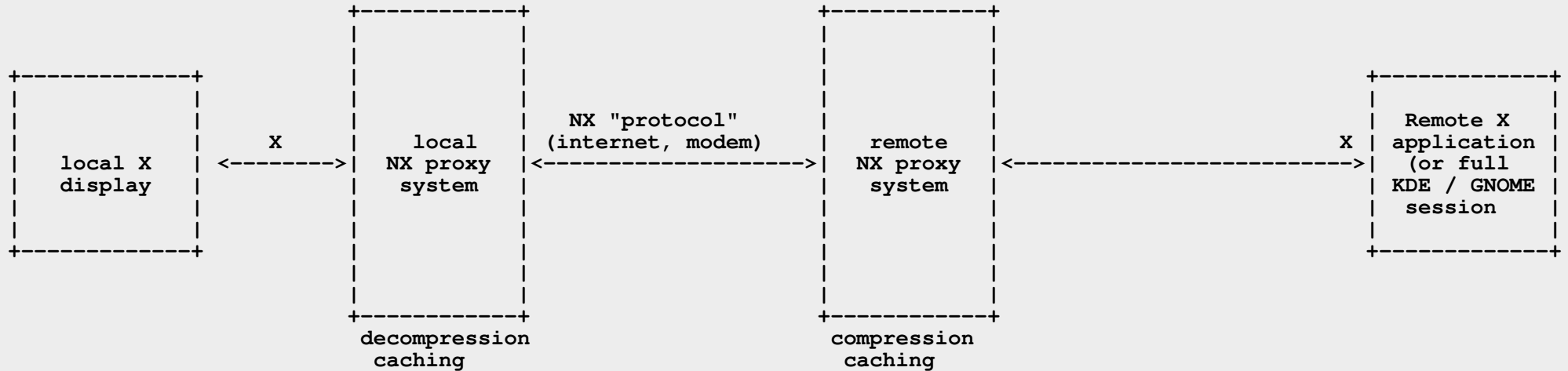
Both caches are kept in sync

Some pieces are not transferred twice (but taken from cache)

Similar pieces are not transferred in full, but use a "differential" transfer

Caches may be made "persistent" (saved to disk and re-used in future sessions)

NX Flowchart: Proxies run "NX" in between them (excellent performance even over ISDN)

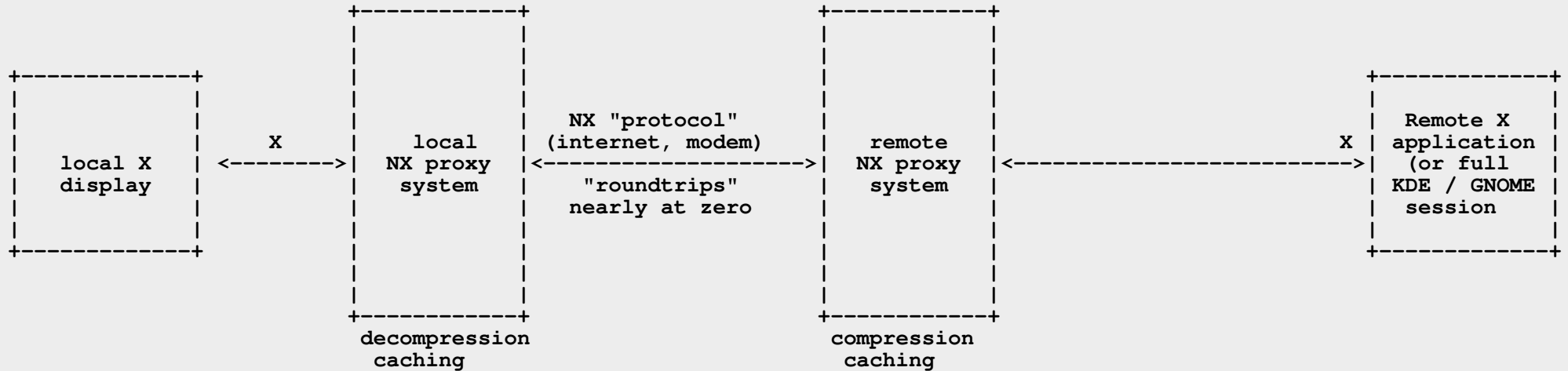


NX "protocol" / NX communication:

=====

- is used for communication and transfer in between proxy systems
- uses highly efficient, very intelligent algorithms (result of years of research and development)
- works extremely well over modem and ISDN connections

NX Flowchart: Proxies reduce "roundtrips" to nearly Zero

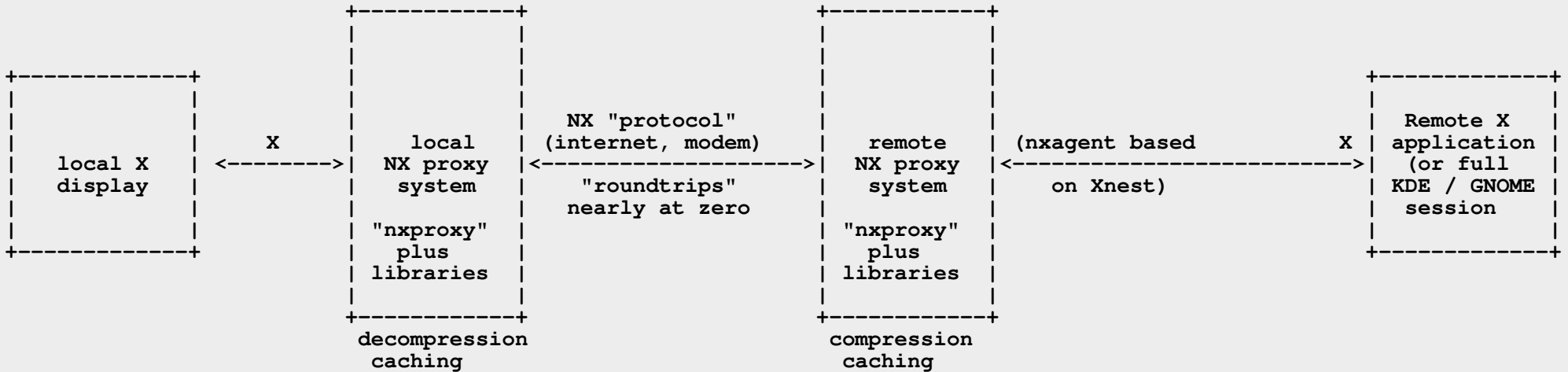


NX "protocol" / NX communication:

=====

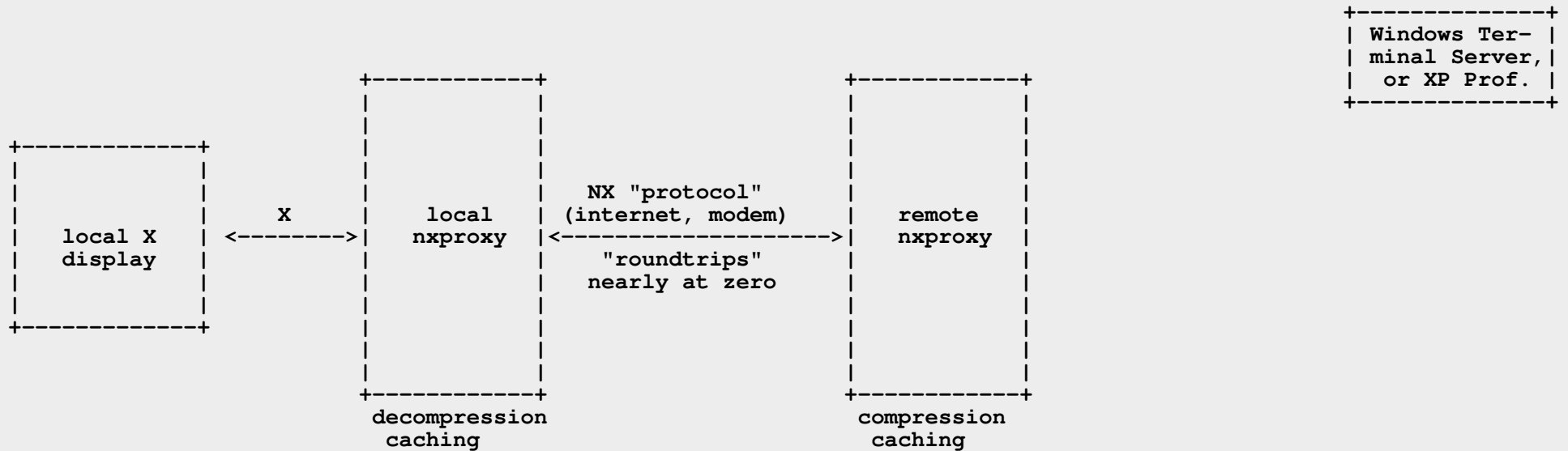
- is used for communication and transfer in between proxy systems
- uses highly efficient, very intelligent algorithms (result of years of research and development)
- works extremely well over modem and ISDN connections
- achieves miracles even for badly designed X applications (which produce lots of unnecessary "roundtrips")
- reduces roundtrips to nearly Zero, compared to vanilla X

NX Flowchart: the role of the "agent"



- "nxagent" (handling remote X connections) is/was based on "Xnest" (heavily modified / largely re-designed)
- nxagent currently only handles full-desktop sessions
- doesn't support "rootless" X (for single application window mode)
- instead, in single application window mode the connection goes directly to the nxproxy

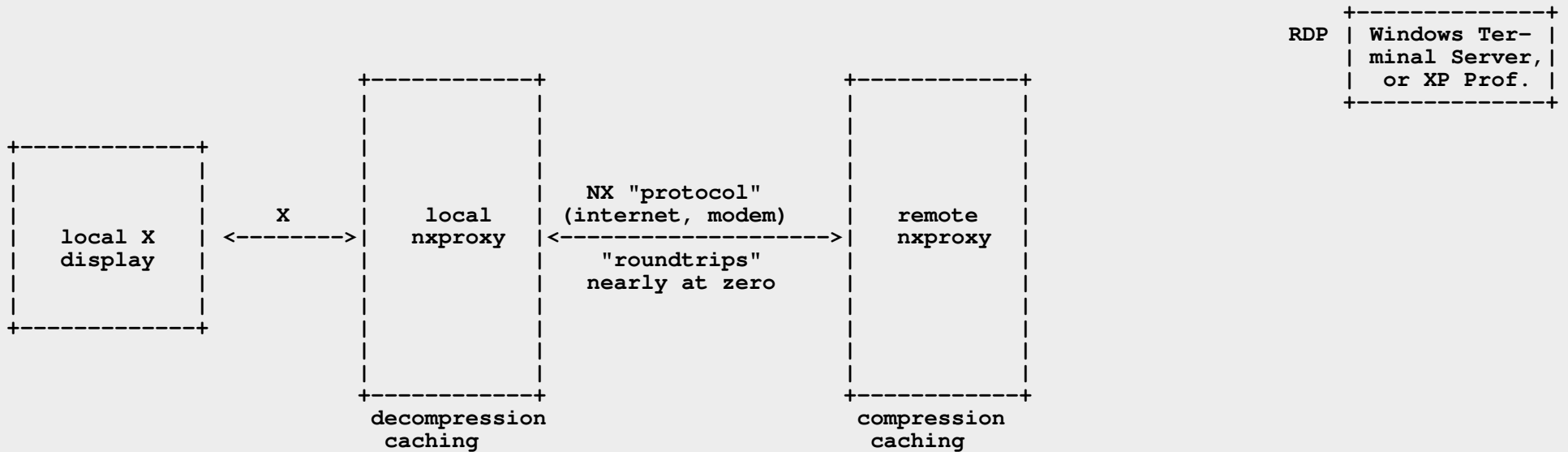
NX Flowchart: connection to remote MS Windows....



Other types of connections are possible:

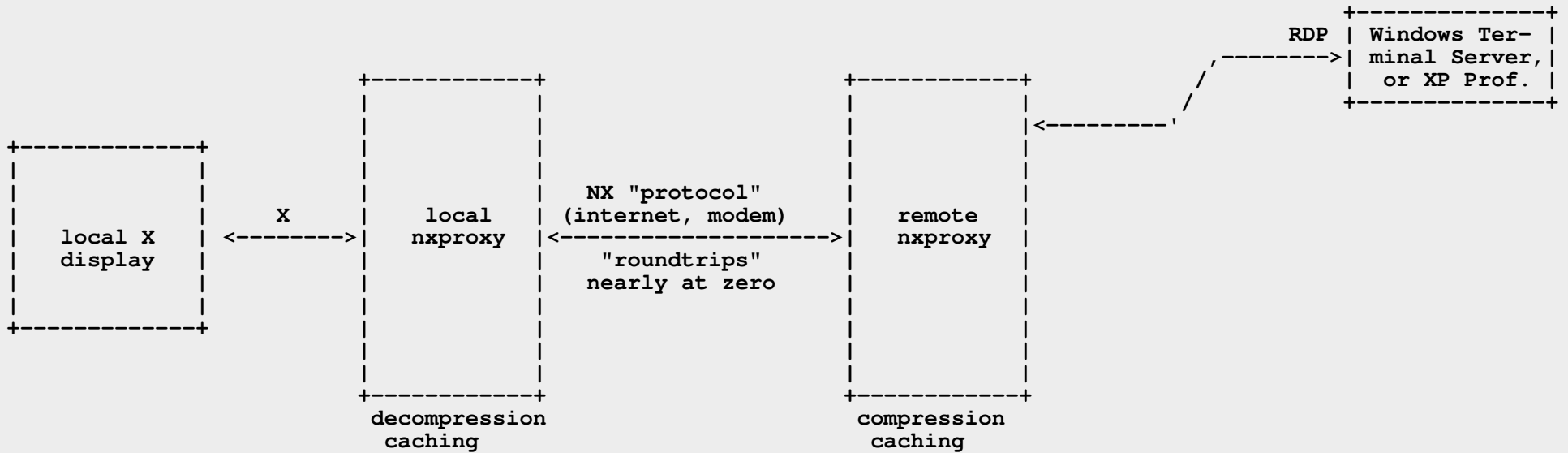
- MS Windows Terminal Servers
- MS Windows XP Professional Edition (allows 1 remote connection)

NX Flowchart: connection to remote MS Windows uses "RDP"....



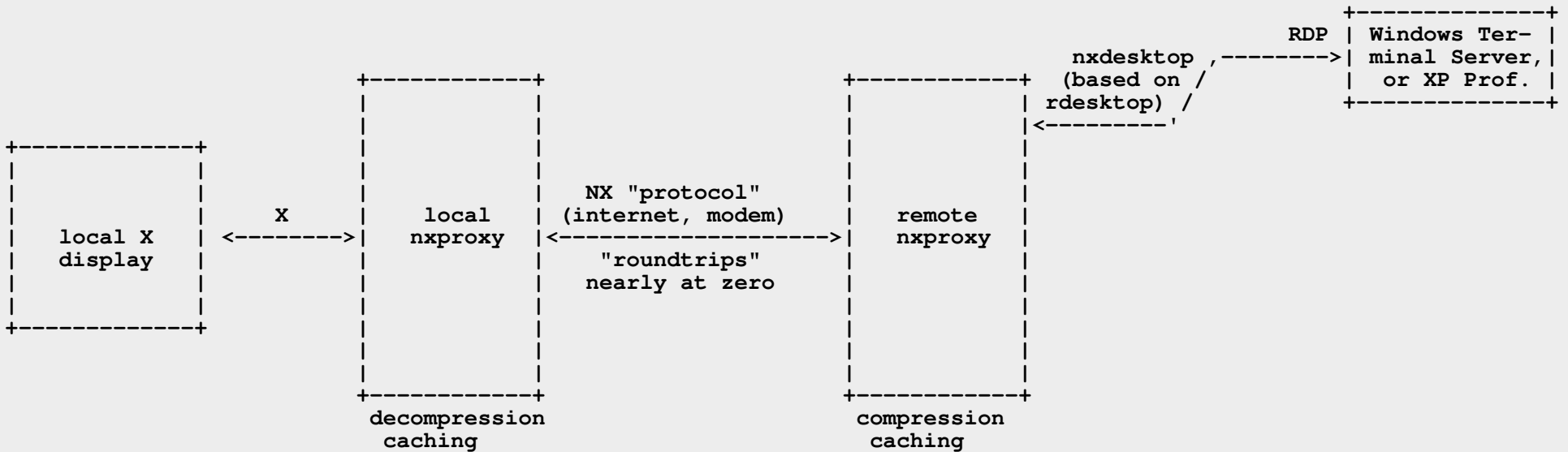
-- remote connections to Windows use RDP ("Remote Desktop Protocol")

NX Flowchart: connection to remote MS Windows uses RDP



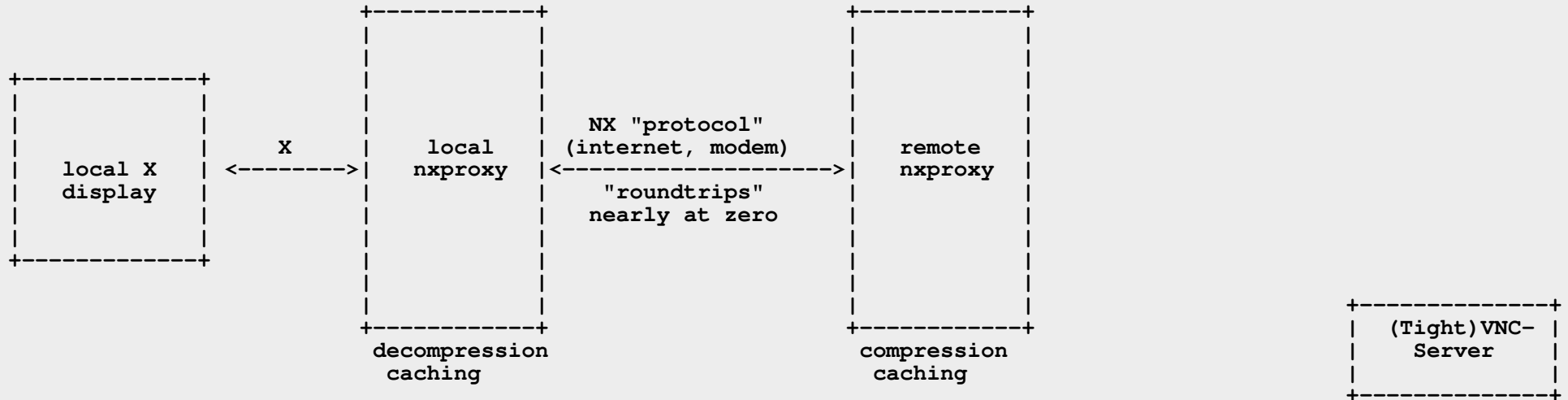
-- remote connections to Windows use RDP ("Remote Desktop Protocol")

NX Flowchart: connection to remote MS Windows uses RDP with the help of "nxdesktop" (agent)



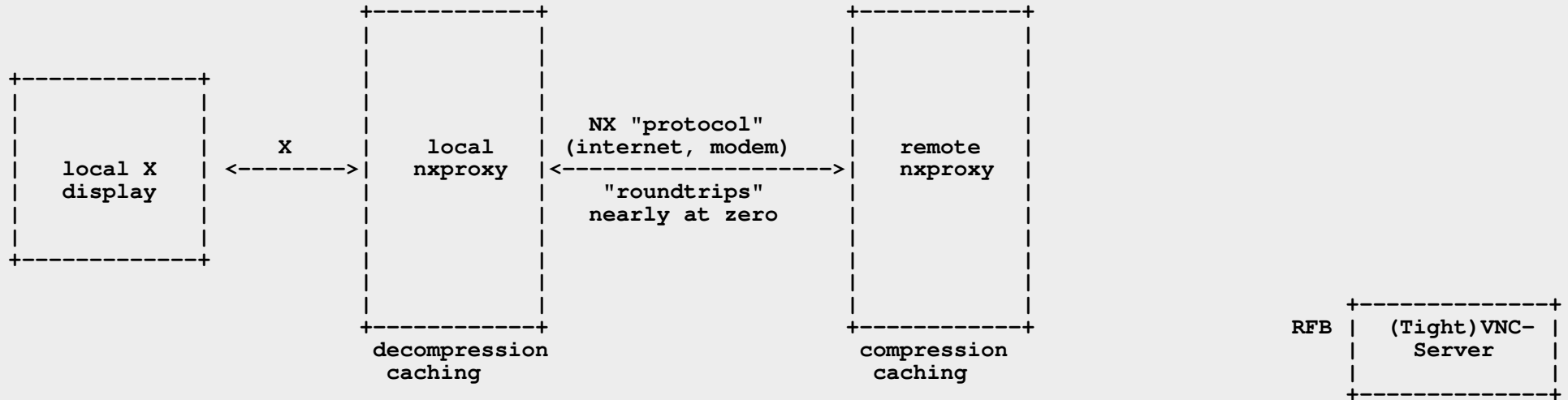
"agent" handling remote RDP connections is based on "rdesktop" (by Matt Chapman)

NX Flowchart: connection to remote VNC server....



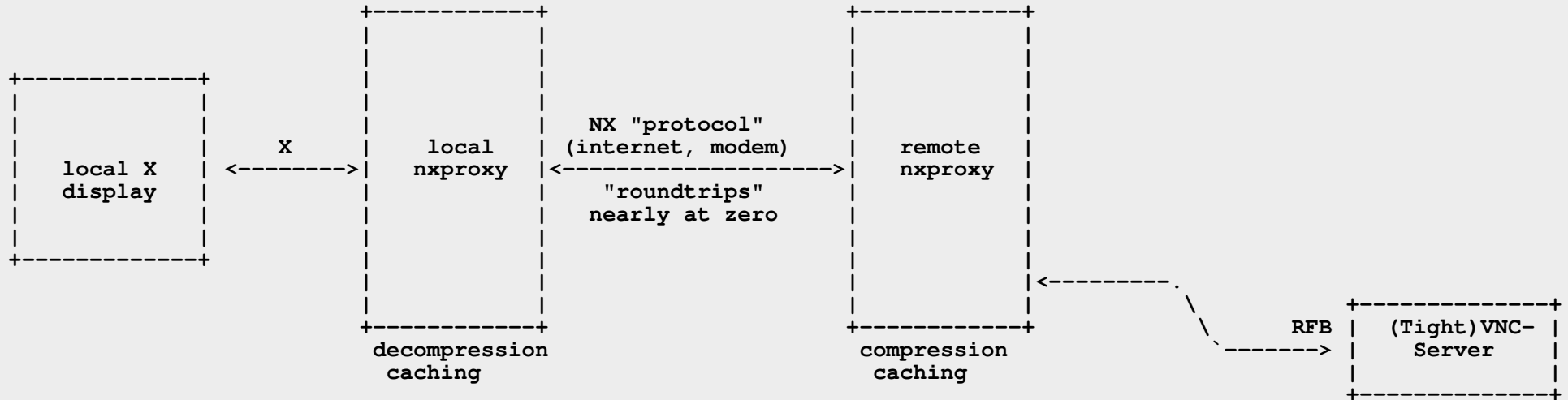
Thirdly, NX supports connections to remote (Tight)VNC servers

NX Flowchart: connection to remote VNC server uses "RFB"



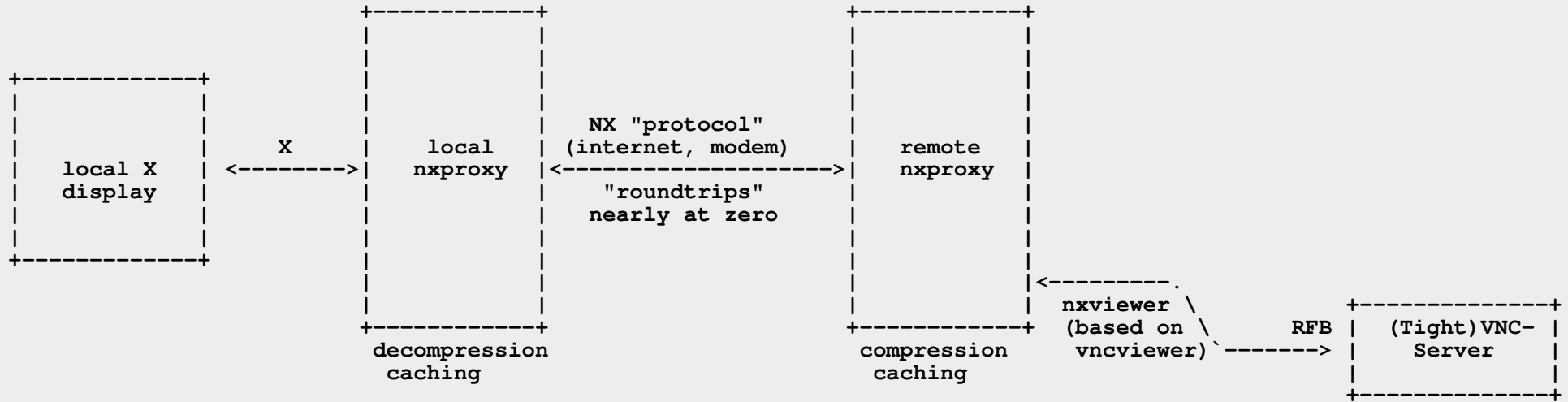
VNC stands for "Virtual Network Computing"
VNC uses the RFB ("Remote FrameBuffer") protocol

NX Flowchart: connection to remote VNC server uses RFB



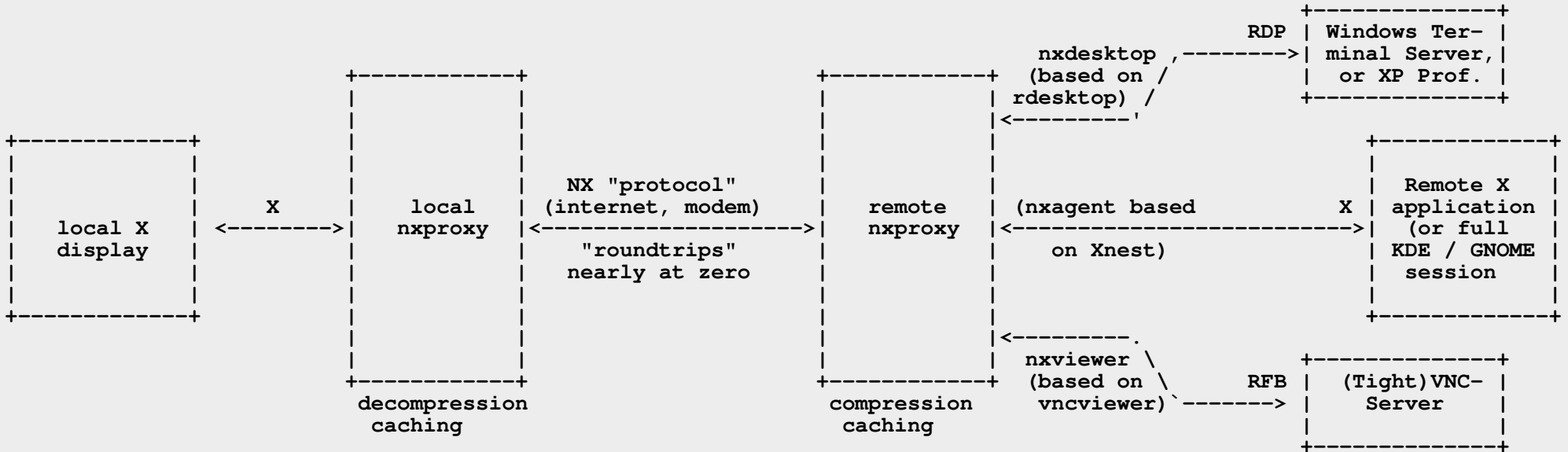
VNC stands for "Virtual Network Computing"
VNC uses the RFB ("Remote FrameBuffer") protocol

NX Flowchart: connection to remote VNC server uses RFB with the help of "vncviewer"



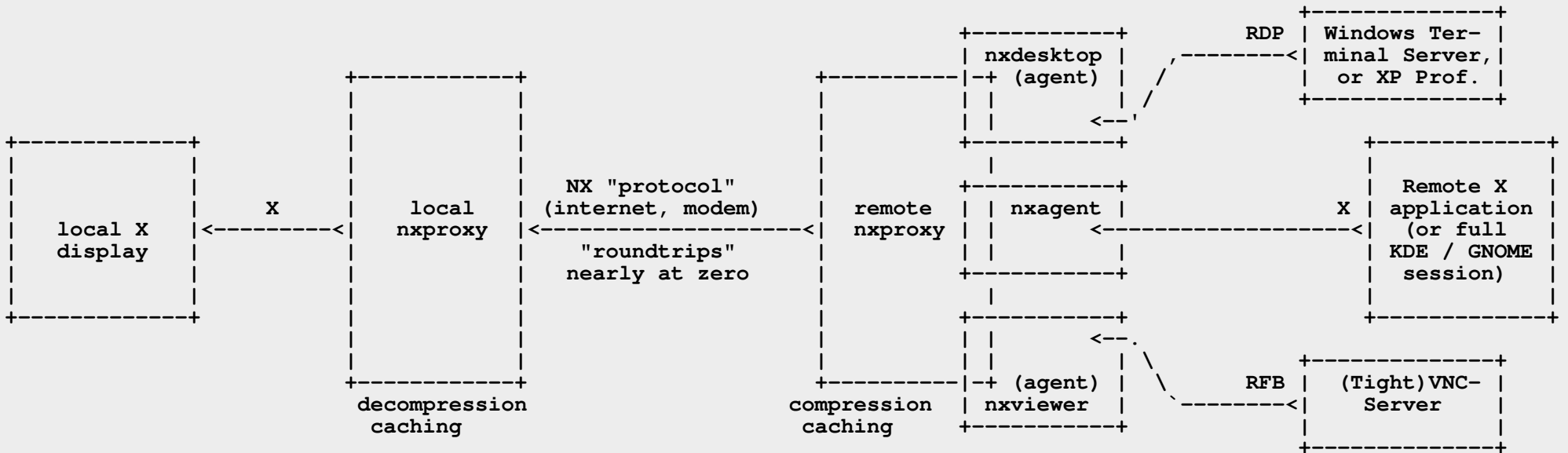
"agent" handling remote VNC connections is based on vncviewer

NX Flowchart: all connection types



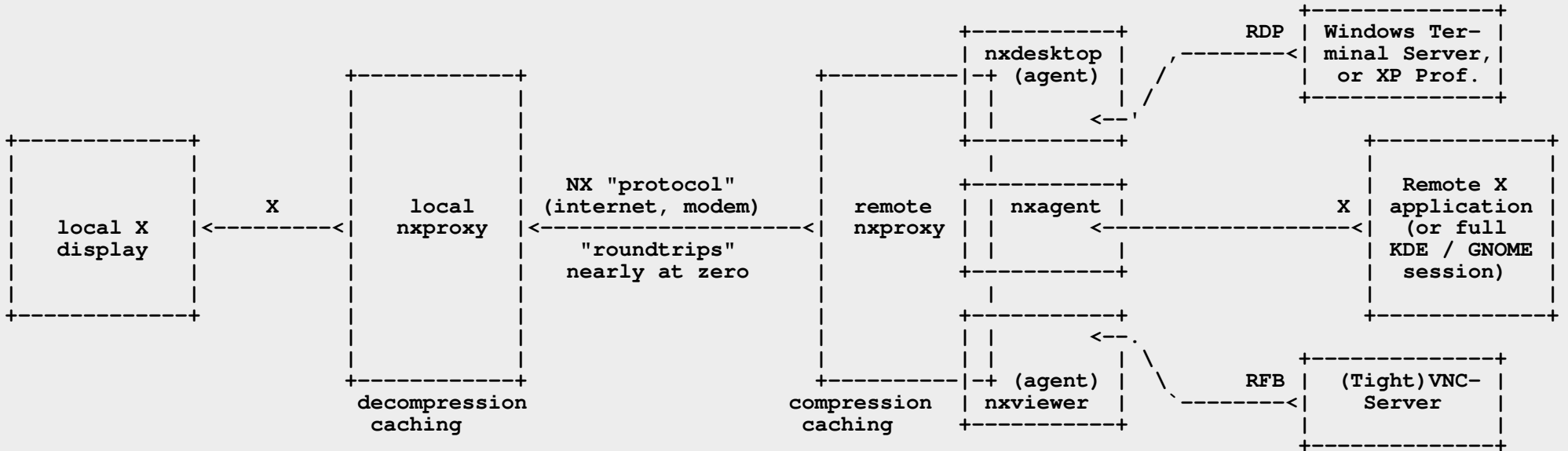
Composite picture of all possible connections

NX Flowchart: all connection types (with "agents")



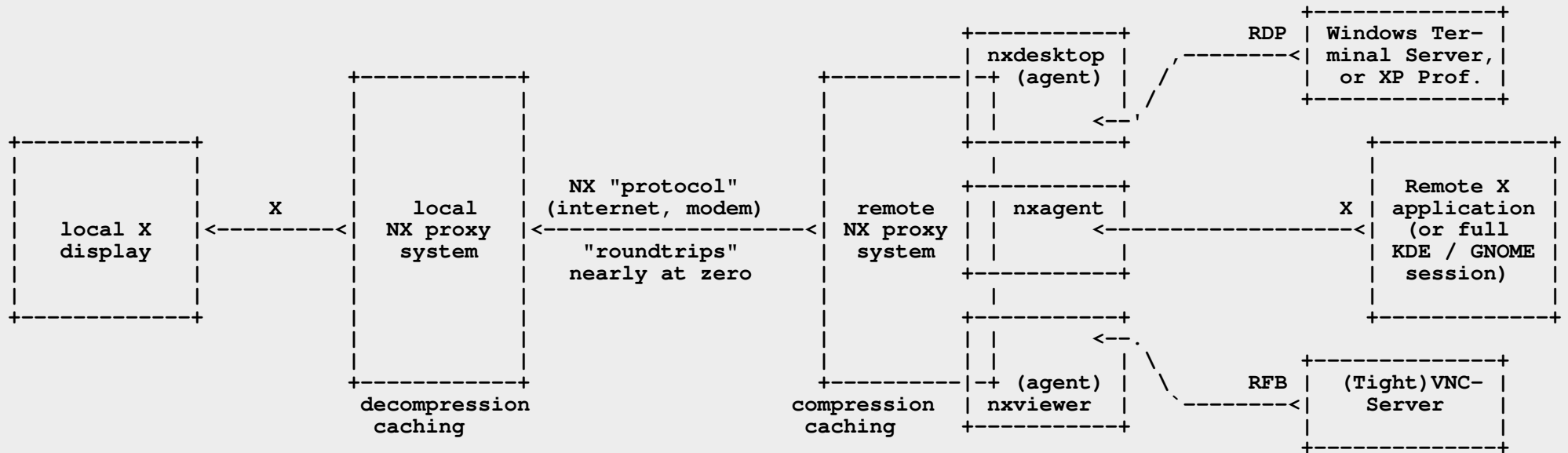
Maybe this drawing makes the individual components more visible....

NX Flowchart



A few facts...
 =====

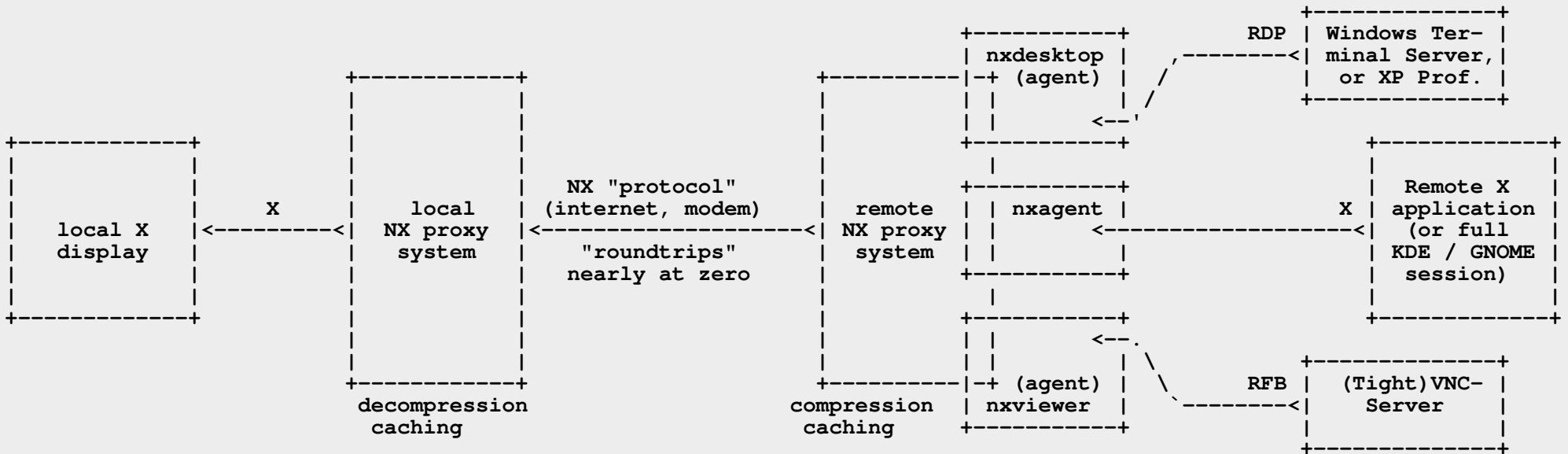
NX Flowchart



A few facts...
=====

over plain old vanilla X: Mozilla startup produces 6.000 roundtrips

NX Flowchart

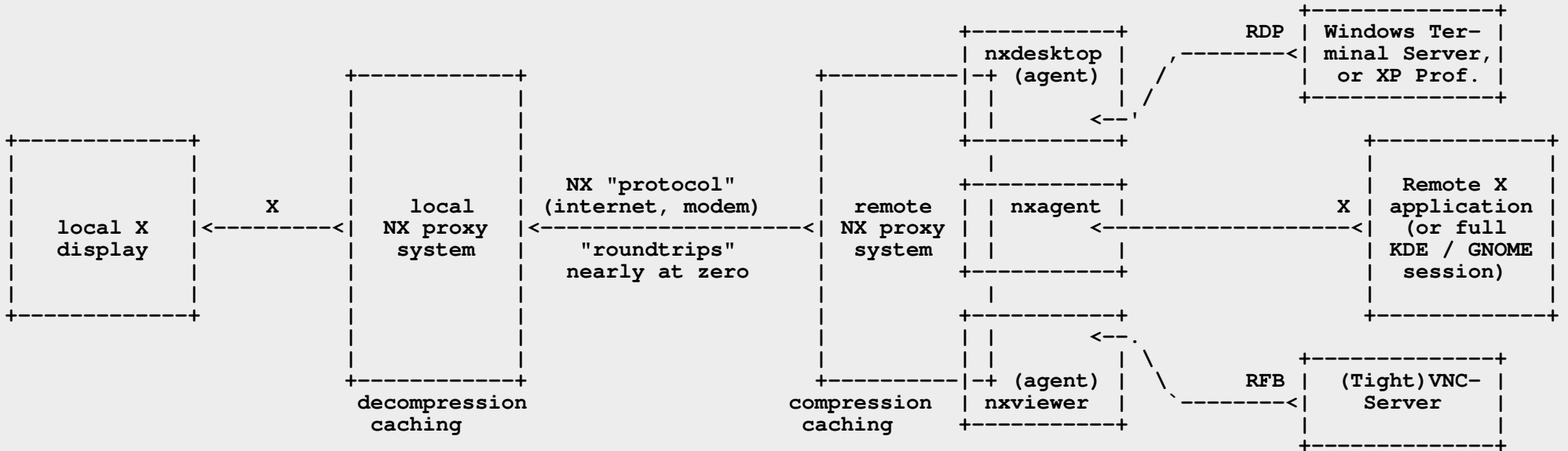


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 over NX: Mozilla startup produces near-Zero roundtrips

NX Flowchart

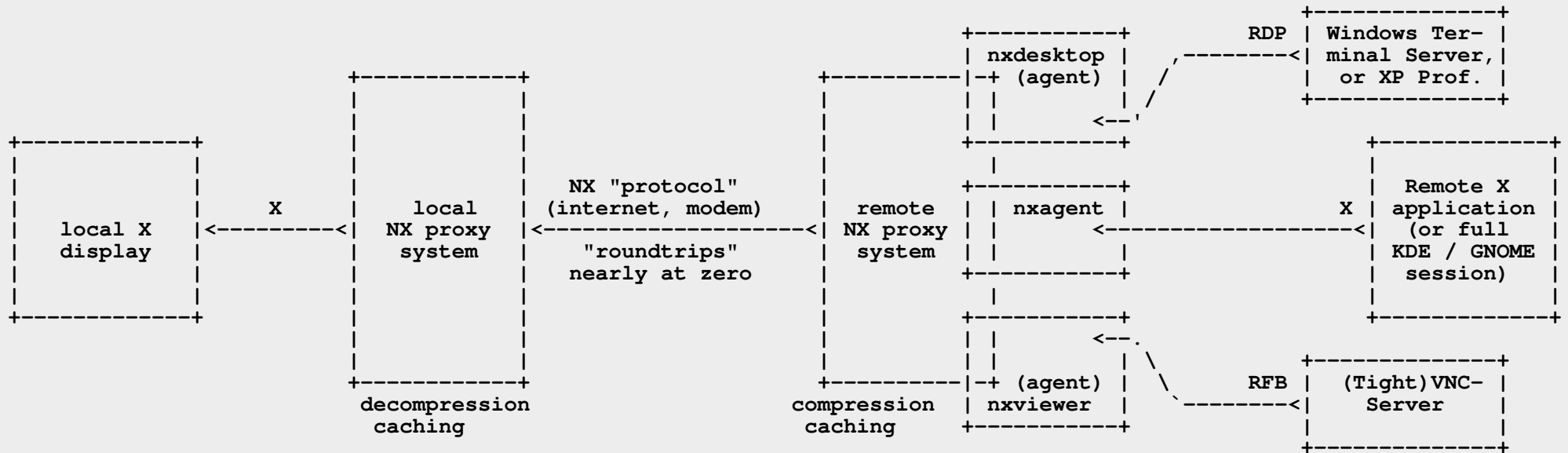


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over plain old vanilla X: Mozills startup takes 7 minutes over a 9.600 baud modem connection

NX Flowchart



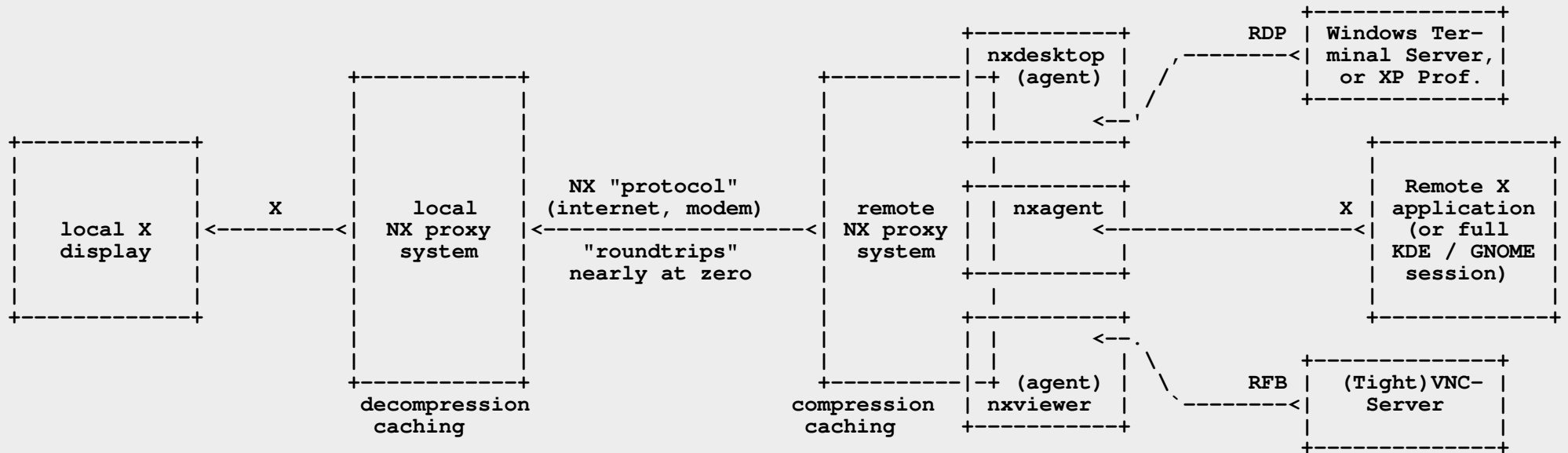
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NX Flowchart



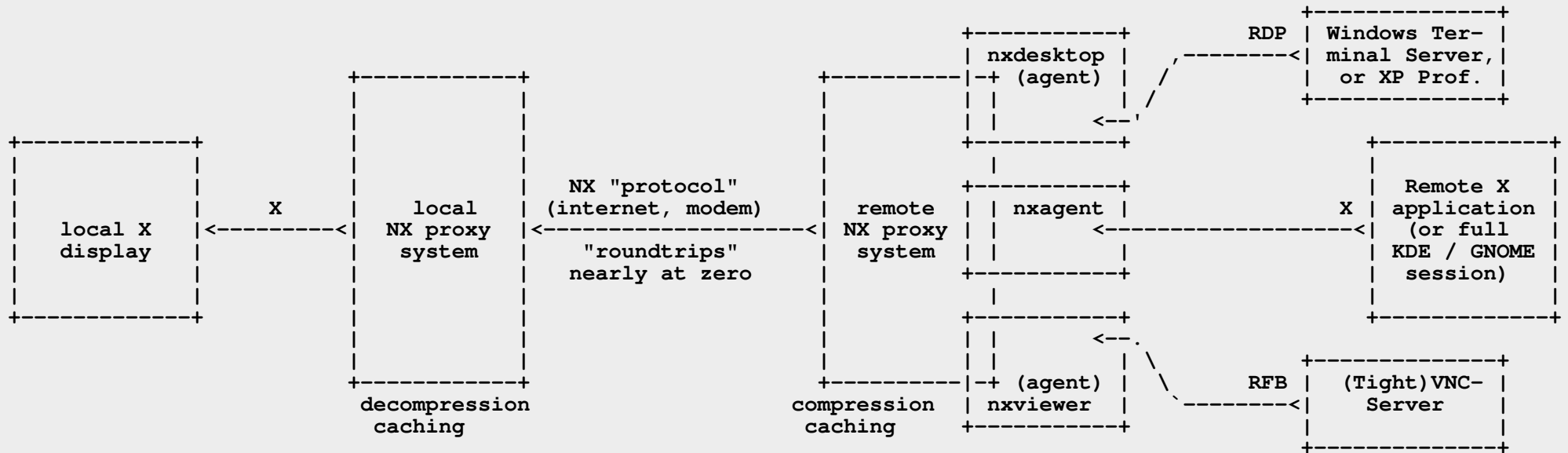
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