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A Remote File and Print Sharing Solution Through Dial-A-LAN Server
Stanley Wang
Hewlett Packard
19420 Homestead Road, MS 44L4
(408)447-4138

Advanced Server for HP-UX(AS/9000) supports file and print sharing functionalities, and Microsoft domain services. With AS/9000 implemented on HP-UX, Windows NT and HP-UX work seamlessly in a heterogeneous environment. The ability to access corporation information remotely becomes a critical solution for most corporates. Today, Microsoft has a solution for mobile computing; a new built-in RAS services and point-to-point Tunneling Protocol (PPTP) are available on Windows NT 4.0. Since one of the business charters for our team is integrating PC client on HP-UX, a similar solution on AS/9000 is expected. The HP's Dial-A-LAN RAS solution seems to be the best candidate at this point. The purpose of this report is to experiment features provided by Dial-A-LAN, and provide a proof-of-concept experience.

HP Dial-A-LAN Remote Access Server

The HP AdvanceStack Dial-A-LAN is a multi-port, multi-protocol remote access server for networks built with HP AdvanceStack Hubs. There are two models of Dial-A-LANs. They are:

- J2623A, a two-port internal V.34 28.8Kbps modem port card
- J2624A, a four-port RS232/V.24 card built for external modem capability

A two-port internal modem port card (J2623A) has been added into a HP AdvanceStack Hub for this exercise.

Dial-A-LAN provides PC users with the following capabilities:

- Dial-in capability that allows users to access their network from remote sites
- Dial-out capability that allows users on a local area network (LAN) to access a remote host or Bulletin Board System (BBS)
- LAN-to-LAN capability that allows multiple users on a LAN to connect to a second LAN
- Management capability that allows network administrators to configure, manage, and monitor the Dial-A-LANs on their network
- Dial-A-LAN prevents unauthorized access to corporate network by providing fix password, NetWare Bindery, TACACS protocol, or third-party strong authentication devices

Dial-In Capability

Remote users, using client software, can dial in from any CCITT-and Hayes-compatible modem and connect to a network through the Dial-A-LAN. The Dial-A-LAN links remote users to the network, making available to them all network services (such as file servers, electronic mail, and printers), just as if they were connected locally to the network. A single multi-port Dial-A-LAN can support multiple dial-in users at one time, and multiple Dial-A-LANs can be used to increase the number of remote users who can be simultaneously connected to the network.

The Dial-A-LAN family supports a range of protocols, including dial-in support to IPX for NetWare access; TCP/IP for IP connectivity; NetBEUI for access to LAN Manager, LAN Server, Windows for Workgroups peer-to peer file sharing, and Windows NT servers; the IEEE 802.2 LLC protocol often used to provide 3270 and 5250 terminal emulation for access to IBM SNA hosts; and Apple Remote Access (ARA) for accessing AppleTalk networks.

The clients used for this exercise are Windows for Workgroup 3.11, Windows 95, WindowsNT 4.0 server and workstation. WFW3.11 requires a network stack before installing the HP Remote client software. An easy choice of the stack will be the Microsoft TCP/IP-32 that can be downloaded from Microsoft's web site (<http://www.microsoft.com>) or ftp server (<ftp.microsoft.com>). The idea is to use the HP remote dial-in driver as a pseudo network adapter, which can be configured with an IP address for dial-in. For more information on how to configure WFW3.11 to use Dial-A-LAN, see Appendix A.

Windows 95 comes with a Dial-up Network that can be used with Dial-A-LAN without any other software. The dial-up adapter, within the network control panel, acts like another lan adapter on the network. A third party authentication mechanism can be added with a simple configuration on the dial-up connection. Since WindowsNT 4.0 has the same user interface as Windows 95, the NT 4.0 configuration is similar to Windows 95. See Appendix B for steps to configure Windows 95 and WindowsNT 4.0.

Dial-Out Capability

By redirecting serial data, the Dial-Out software allows users on an Ethernet network to share a modem attached to the Dial-A-LAN located on their LAN to dial out to a remote host or BBS. Every user who has dial-out enabled in the user list and has access to the network that the Dial-A-LAN is on, has access to the Dial-A-LAN's modems (including dial-in clients).

LAN-to-LAN Capability

The LAN-to-LAN function allows multiple users to share network services over one or more connections between two (or more) Ethernet LANs. LAN-to-LAN connections allow you to establish full routing connections between LANs over ordinary telephone lines. Two Dial-A-LAN devices that support LAN-to-LAN connections (one on each network to be linked) can be connected to create a temporary intranet that appears to users as one large network rather than two or more smaller networks. IP, and IPX traffic is routed between the two networks to create one large network. A Dial-A-LAN on either network can establish the LAN-to-LAN connections.

Comprehensive Management

The Dial-A-LAN comes complete with Dial-A-LAN Manager (DLM), the management software with an GUI MS-Windows interface. You can configure a Dial-A-LAN from any local or remote PC/workstation on the network using DLM or the command shell. DLM provides the following features:

- **Advanced Configuration Interface**

DLM provides a MS-Windows graphical user interface with point-and-click convenience, keeping initial set-up and ongoing maintenance quick and easy. A command shell is also provided for administration from a UNIX system. In a pure UNIX shop, a BOOTP server plus a TFTP server provide an excellent bootstrap process to bring up the Dial-A-LAN server. For explanation on this process, see Appendix C.

- **Easy-to-Use Configuration Files and User Lists**

Using DLM, you can create a configuration file and user list, then download this information to all of your Dial-A-LANs. For example, if you have 20 devices with the same users, you can use DLM to add all of the users and assign their access privileges. Then, you highlight the Dial-A-LANs you need to configure and download the user list to all the devices at the same time. This capability applies to configuration files as well.

- **Extensive Troubleshooting Tools**

DLM includes a Get Info command that gives you access to general information about Dial-A-LAN, as well as pertinent IP, IPX, AppleTalk, and Ethernet statistics. For example, if users are complaining of

erratic performance over a dial-in connection, you can view Dial-A-LAN's Ethernet statistics and find out if there is a large number of collisions.

The comprehensive Activity Logger --a Windows-based software tool provided with the Dial-A-LAN-- also aids troubleshooting. This tool allows an administrator to monitor the activity of multiple devices. With it, network administrators learn when a device was last restarted, who has dialed in and for how long, the reason for a connection drop, whether modems were initialized properly, and much more.

- **Security**

Dial-A-LAN provides various authentication method that works best for corporate network -- from passwords to third-party security devices. The user list allows user names and passwords to be used to control access to the device. The NetWare Bindery security features are also supported by Dial-A-LAN.

In addition, Security Dynamics, Inc. (SDI) manufactures two security solutions that are compatible with Dial-A-LANs. The first is a multi-port, stand-alone device that can be inserted between the Dial-A-LAN and the modem; this solution requires no particular configuration of the Dial-A-LAN; the device dialing in must be capable of handling the authentication dialog. SDI's second security solution that is supported by the Dial-A-LAN is Security Dynamics ACE/Server, which is a system of server and client software and SecurID token cards. Once enabled, SecurID authentication is used for all protocols (IP, IPX, NetBEUI, LLC, and ARA). In our exercise, a separate HP-UX workstation is running the ACE server to provide the strong authentication capability.

The Dial-A-LAN may use SecurID to protect its serial ports from unauthorized dial-in access. In conjunction with the Dial-A-LAN user list or the NetWare Bindery, SecurID guarantees that users are who they claim to be. Thus, SecurID allows the user list or NetWare Bindery authentications to be less restrictive; for example, these authentication database can permit "guest" and "group" names for users.

Conclusion

Dial-A-LAN provides simple, reliable, secure and affordable remote access solution to corporate intranet. AS/9000 can team up with Dial-A-LAN to provide RAS type of solutions, so that the needs of remotely share files, share printers, and participate domain services will be addressed. With careful planning, a mid-sized company could use AS/9000 and Dial-A-LANs to build an economic file and print sharing network for multiple sites.

Alternatively, AS/9000 can take advantage of the existing HP-UX SLIP server with the ACE server to implement similar secure remote access solution.

Appendix A. Configure a Windows for Workgroup 3.11 PC client to access Dial-A-LAN server.

- Install HP remote dial-in software on a wfw311 PC
- Install Microsoft TCP/IP32 on the PC
- Configure HP remote software by invoking the following screens:
 - a) Double-click [HP Remote Connect]
 - b) Fill-out the fields:
 - i) Description: Dial-A-LAN sample
 - ii) Dial-in Name: sample
 - iii) Password: ***** (the password will not show up on the screen)
 - iv) Phone Number: 1234567
 - c) Click on [Options] will lead you to the screen titled [Connection File Options]
 - d) Fill-out the following fields:
 - i) Desired Protocols: IP Enabled (the IP Address can be blank if the server assigns client's IP)
 - ii) Third-party security device installed
- Click [Tools] [Port Setup] to setup your modem
- Click [File] [Make Icon] to make this configuration an icon
- Click [Connect] to make a connection to Dial-A-LAN
- Press <Enter> three times on a screen titled [3rd-Party Security] to start authentication
- Click [Continue] to continue logon process
- Press [OK] when a screen titled [Connect] displays your PC's IP address

Start from this point, you are connected to your corporate intranet. You should be able to use your share, or use network applications, e.g. browser, telnet, ftp...

Appendix B. Configure a Windows 95 or WindowsNT 4.0 PC client to access Dial-A-LAN server.

Windows 95/NT4.0 has a Dial-up network facility that is integrated into Dial-A-LAN smoothly. The following steps briefly highlight the configuration flow:

- [Control Panel] [Add/Remove Programs] [Windows Setup] [Communications] [Details] [Dial-Up Networking]
- [My Computer] [Dial-Up Networking] [Make New Connection]
- Highlight the new connection that was created on previous step.
[File] [Properties] [Server Type] [TCP/IP Settings] [Server Assigned IP address]
- [Configure] [Options] [Bring up terminal window after dialing]
- Double-click the new icon to start dial-in.
- Press <Enter> three times on a screen titled [Post-Dial Terminal Screen] to start authentication
- Click [Continue] to continue logon process
- If everything is ok, a window titled [Connected to XXXX], where XXXX is the connection name, will be displayed on the screen.

Start from this point, you are connected to your corporate intranet. You should be able to use your share, or use network applications, e.g. browser, telnet, ftp...

Note that Windows NT 4.0 installs the dial-up networking from [My Computer], while Windows 95 installs from [Control Panel].

Appendix C. Using a BOOTP Server to configure.

You can boot your Dial-A-LAN from a BOOTP server (any IP host running the BOOTP and the TFTP daemons on an IP network).

Whenever a Dial-A-LAN cold starts, it sends out a BOOTP request to the Ethernet broadcast address. If your workstation is running the bootpd server, the workstation replies to the request only if the device's Ethernet address is in its bootptab file. The workstation's reply depends on finding information on the location of certain files referred to in the bootptab file.

The workstation recognizes the Dial-A-LAN by its Ethernet address, which is sent to the workstation with the Dial-A-LAN's request.

The workstation provides the device with a host name and an IP address. The device then requests the software files through TFTP. When these files are downloaded successfully, the Dial-A-LAN is operational.