VM and VSE Internetworking

Alan Altmark
IBM Corporation
Endicott, New York

This presentation discusses VM/ESA connectivity options and how they can connect your VSE guests and their data to the outside world. We'll discuss TCP/IP and APPC connection capabilities and how both can be used to deliver data to the World Wide Web!

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VM Connectivity Basics

- Native

- SNA

- TCP/IP

- Combinations

Native Communications

- Three native communications facilities in VM/ESA:
  - IUCV   Inter-user Communications Vehicle

  - VMCF   Virtual Machine Communications Facility

  - APPC/VM   Advanced Program-to-Program Communications

- All designed to communicate between virtual machines

Native Programming Interfaces

- ◾ VMCF
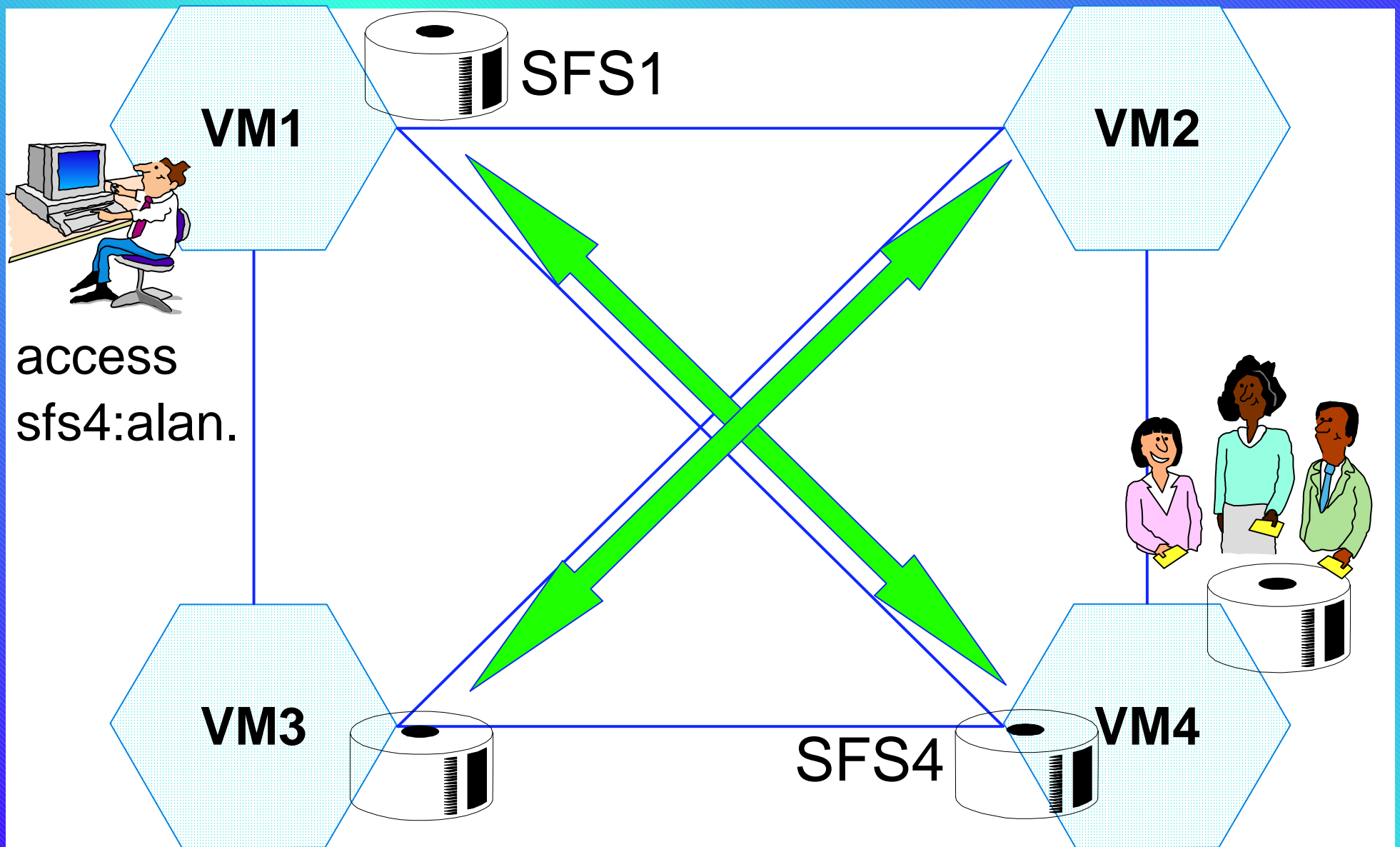 - ▪ Assembler only

- ◾ IUCV
  - ▪ Assembler only - IUCV and CMSIUCV macros

- ◾ APPC/VM
  - ▪ Assembler - APPCVM and CMSIUCV macro
  - ▪ High level languages
    - ● CPI Communications (CPIC) cross-platform API

A VM Collection

VM/ESA
VSE/ESA
Technical Conference

VM1

SFS1

VM2

access
sfs4:alan.

VM3

VM4

SFS4

Collections

- Simple to create
  - CP ACTIVATE ISLINK command
  - No configuration files to maintain
  - Auto-discovery

- Any APPC/VM global or private resource can be accessed from any system in the collection
  - Web server can reach any SFS or BFS filepool, or DB2 database

- Can move resources around without changing end-user configuration

SNA

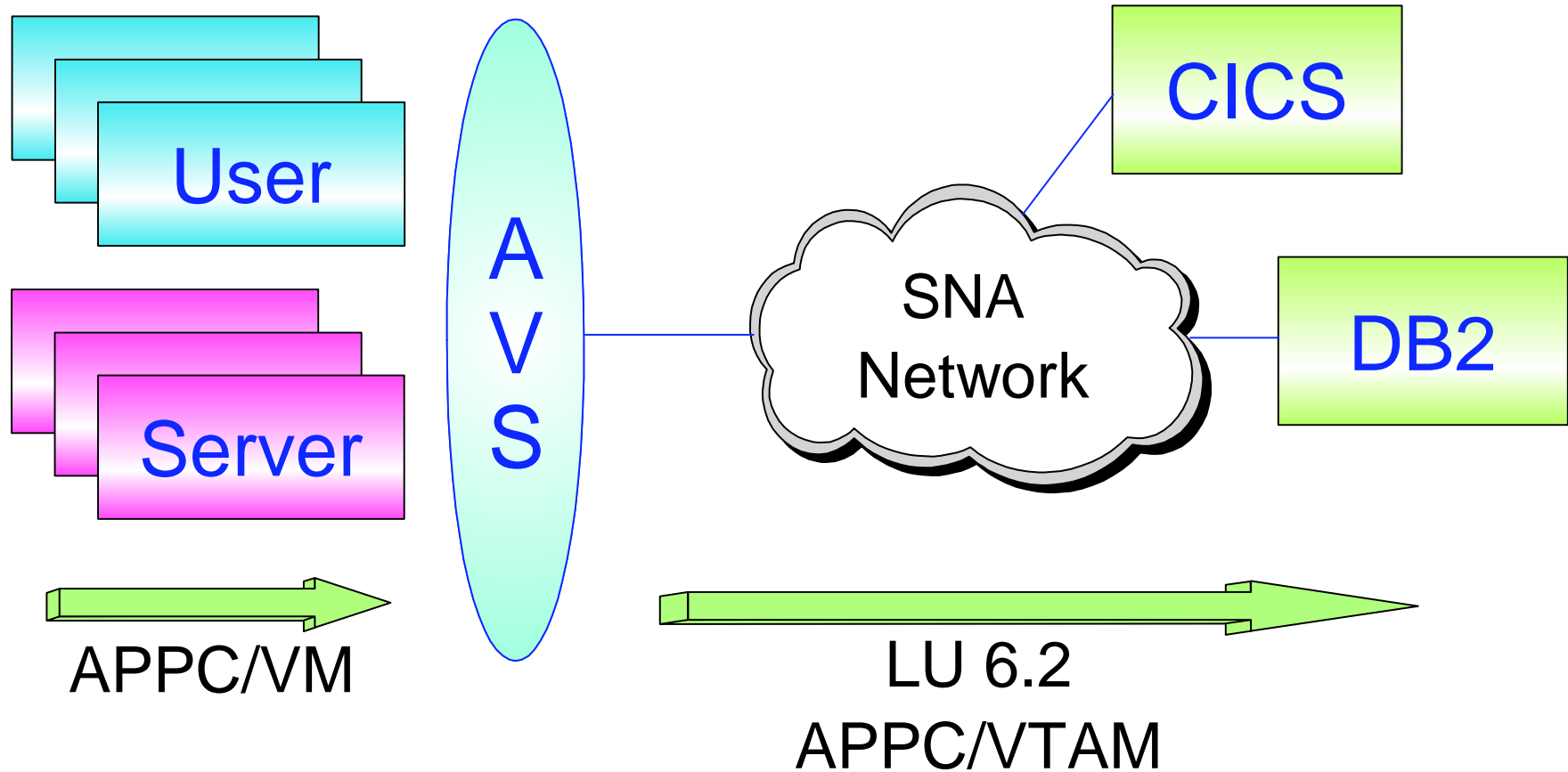- **A**PPC **V**TAM **S**upport

- VTAM application that provides transparent gateway between CMS and remote LU 6.2 applications
  - DB2
  - SFS
  - CICS

What is AVS?

User

Server

A
V
S

CICS

SNA
Network

DB2

APPC/VM

LU 6.2
APPC/VTAM

AVS translates between APPC/VM and APPC/VTAM

TCP/IP

TCP/IP

- Priced feature of VM/ESA

- Included on DDR

- Employs Enable/Disable technology
  - No separate tape to install

TCP/IP Services

TFTP

DNS

lpr, lpd

FTP

DHCP

RouteD

BootP

TCP/IP
TELNET

NFS

SMTP

PCnfs

SNMP

DB2

Location Broker

rexec / rsh

Kerberos

TCP/IP APIs

- Low level API using IUCV or VMCF

- HLL APIs available for C, Pascal, and REXX
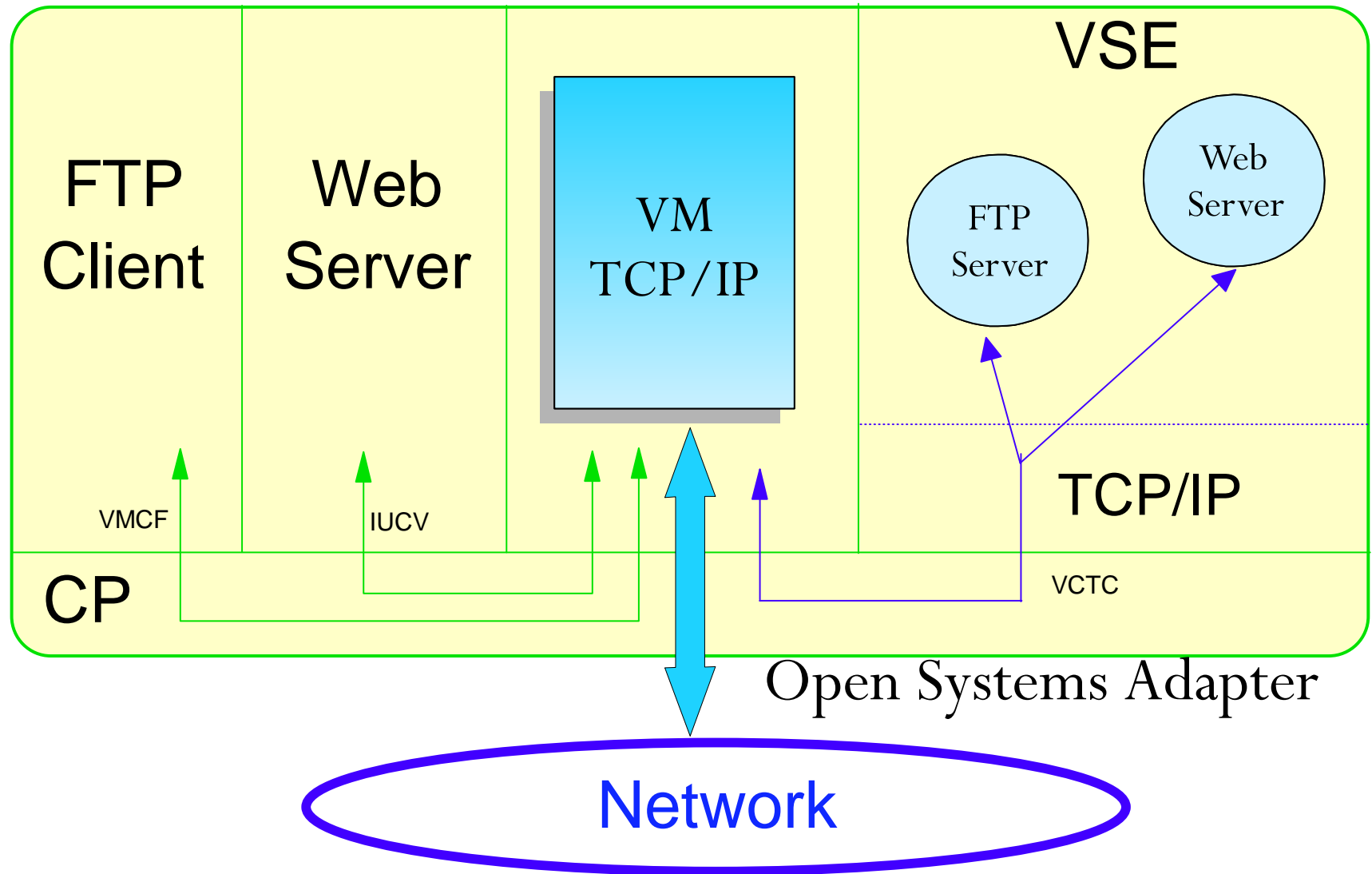 - C and REXX are based on IUCV
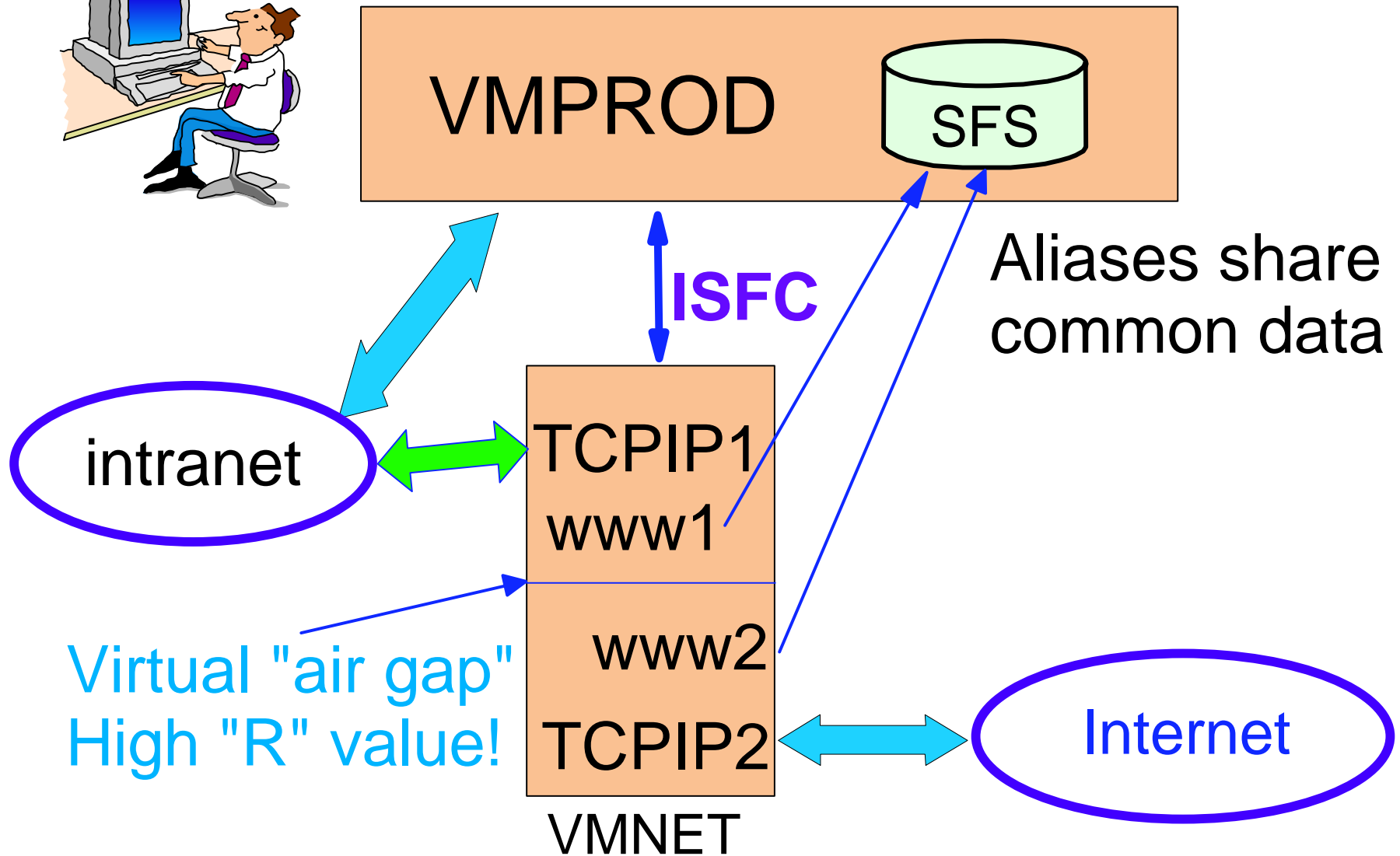 - Pascal is based on VMCF

- Pascal/VMCF interface offers additional control functions

Solutions

Insulation Properties

Did You Know....?

- You can run multiple TCP/IP stacks

- They are insulated from each other
  - Virtual "air gap"

- You decide which services to provide

- Internet users get access only to the information you allow

Did You Know....?

- One web server for intranet, one for Internet
  - Both access same filepool, different subdirectories

- Users on VMPROD access SFS on VMPROD or VMNET

- No need for VMPROD users to have ids on VMNET

VM/ESA as an NFS Security Server

- The Network File System (NFS) provides for UNIX-style access to a remote file system

- NFS clients work best when PC/NFS protocol is used
  - VSE NFS server does not support PC/NFS

- VM/ESA can provide the facility to map user IDs to UNIX-style UIDs and GIDs
  - Not all clients allow you to direct PC/NFS requests to a different host
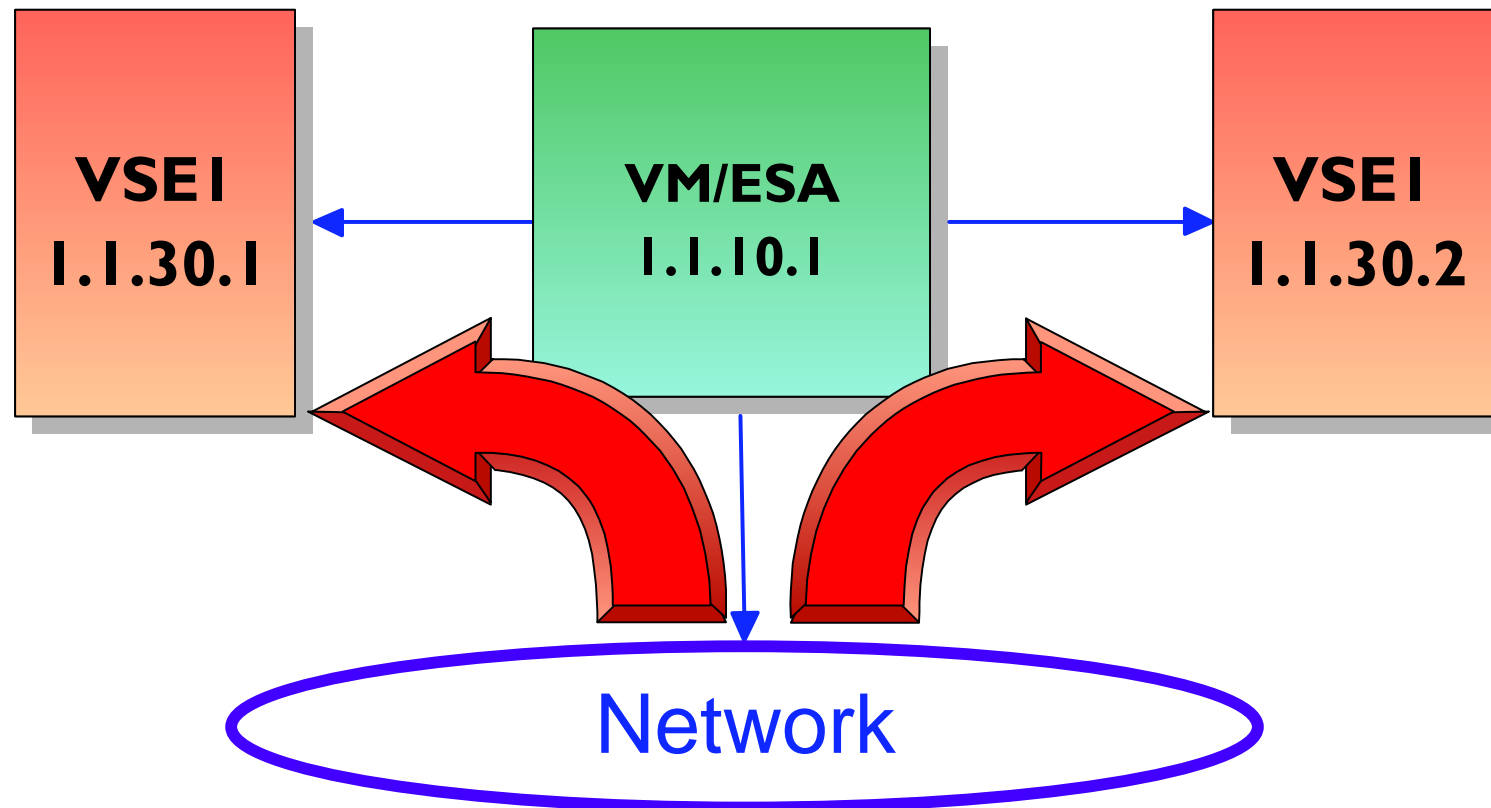 - APAR PQ16301 for VM/ESA V2R3

Routing

- VSE TCP/IP does not support dynamic routing using RIP protocols

- VM TCP/IP supports RIPv1 and RIPv2
  - Will continue to upgrade dynamic routing support

- VM can provide TCP/IP routing services for VSE

- Allows VSE to participate in a dynamic backbone
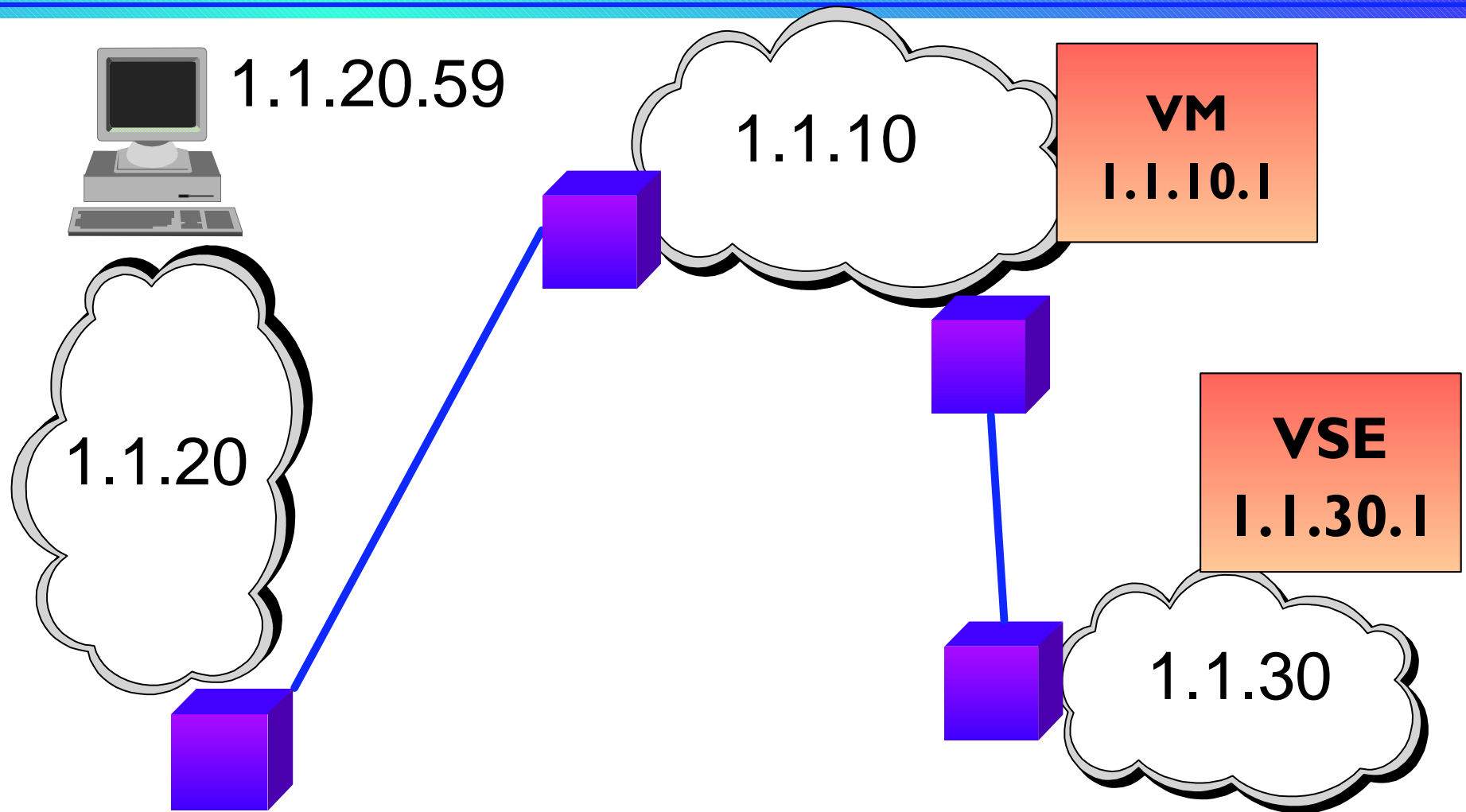
VM/ESA as a Gateway

VM/ESA as a Gateway

■ Define point-to-point CTC connection to each VSE guest

■ Set up ROUTED and BsdRoutingParms

```
BSDRoutingParms true
   VSE1 1500    0 255.255.255.0  1.1.30.1
   VSE2 1500    0 255.255.255.0  1.1.30.2
EndBSDRoutingParms
```

■ Create ETC GATEWAYS file

```
host 1.1.30.1 gateway = metric 1 permanent
host 1.1.30.2 gateway = metric 1 permanent
```

VM/ESA as a Gateway

- Put VSE systems in a different subnet

- If using static routing, update router to send VSE subnet packets to VM

- The only miracles are the ones you create!

- Automatically DIAL VSE

- Map IP address to LU name
  - e.g. 1.1.25.42 = DIAL VSE 192A
  - Not 100% foolproof, though!

- Can select different guests based on client IP address and VM telnet server port
  - port 23   DIAL VSE
  - port 10023   DIAL VSE2
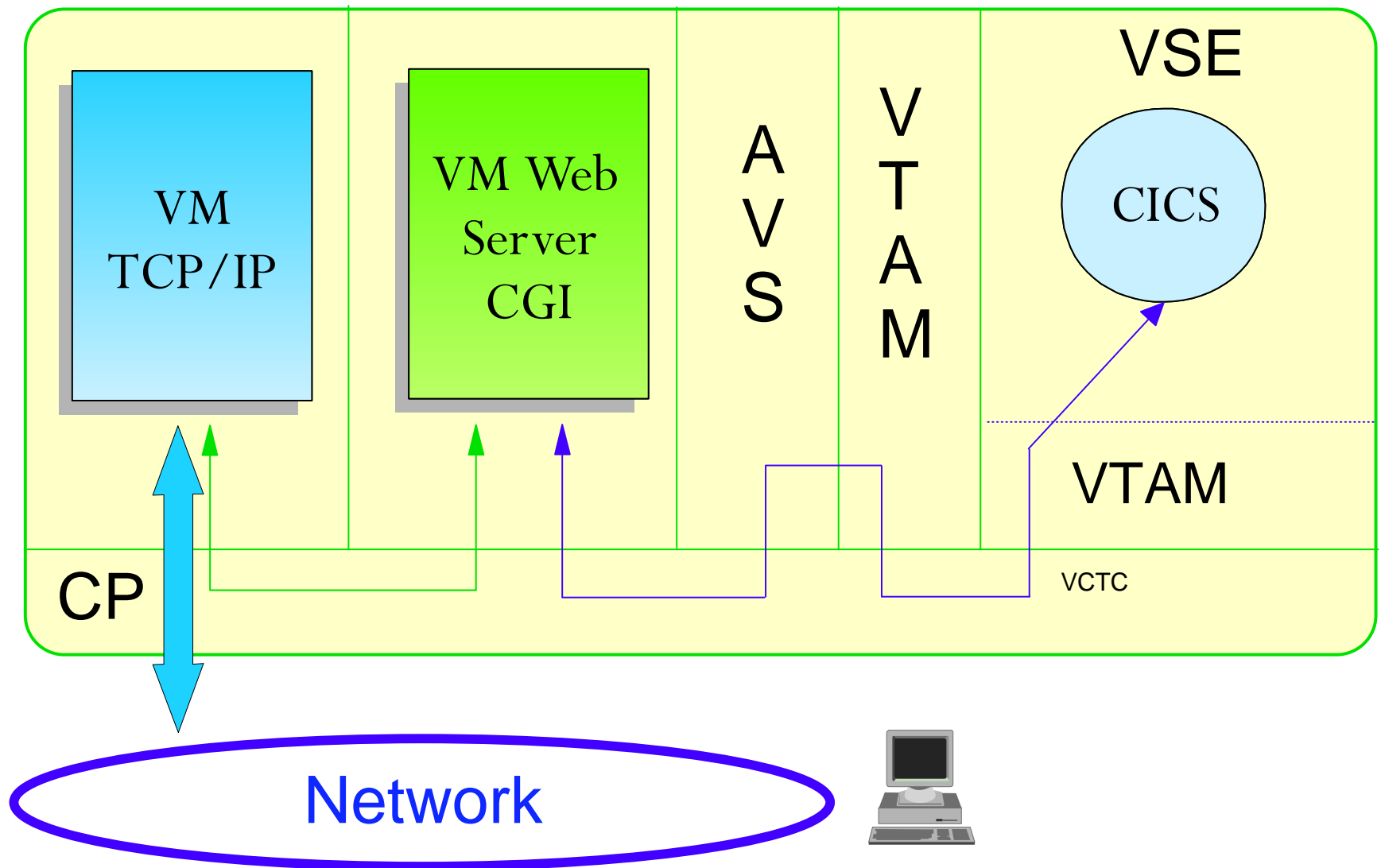 - port 20023   Give VM logo

Combining TCP/IP and SNA

- Can use VM to provide internet/intranet connectivity

- Use APPC and SNA to connect VM to guest legacy applications
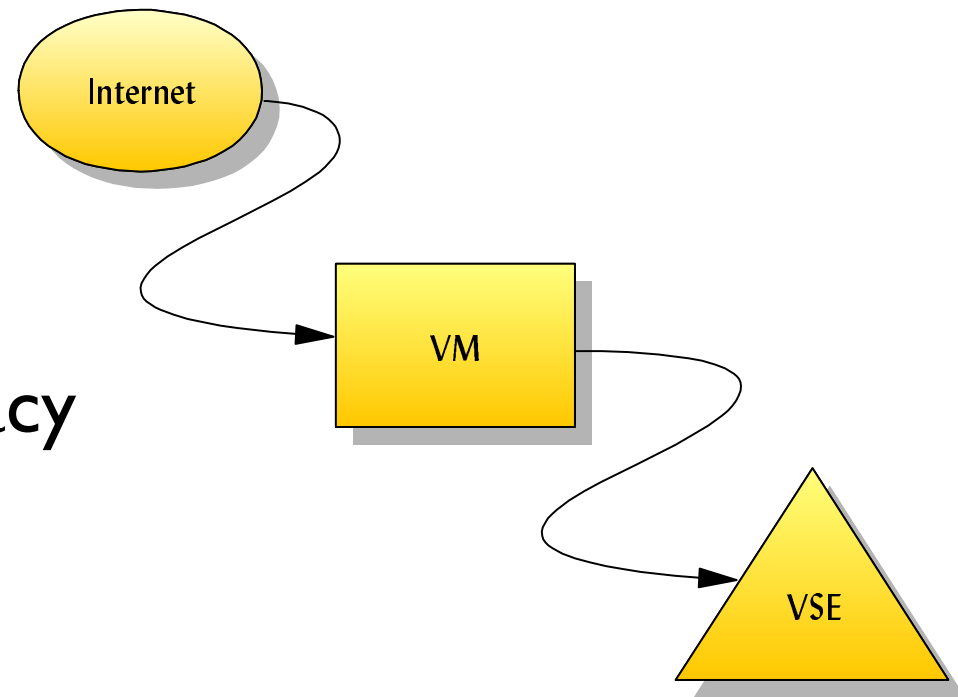
Summary

- Many options

- Limited only by your imagination
  Be creative!

- Don't be afraid!

- Let us know when you've done something unusual

Reading List

- *VM/ESA Connectivity, SC24-5756*

- *SAA CPI Communications, SC26-4399*

- *CPI Communications Users Guide, SC24-5595*

- *TCP/IP for VM Planning and Customization, SC24-5847*

- Textbooks on TCP/IP

Contact Information

- By e-mail: Alan_Altmark@us.ibm.com

- In person: USA   607.752.6027

- On the Web: http://www.ibm.com/vm/devpages/altmarka

- Mailing lists: IBMTCP-L@vm.marist.edu
  VMESA-L@listserv.uark.edu

- On TalkLink: TCPIP CFORUM
  VMESA CFORUM