

Migrating to the z/VM Virtual Switch V24

Alan Altmark
z/VM Development
Endicott, NY

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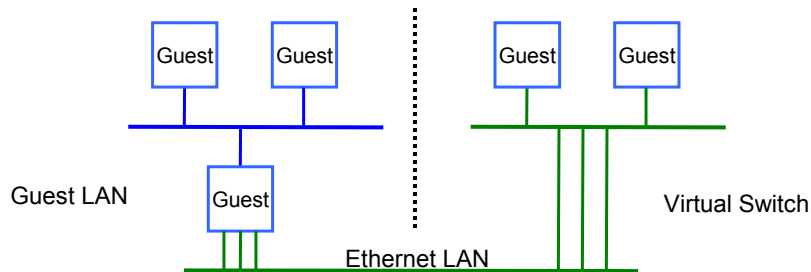
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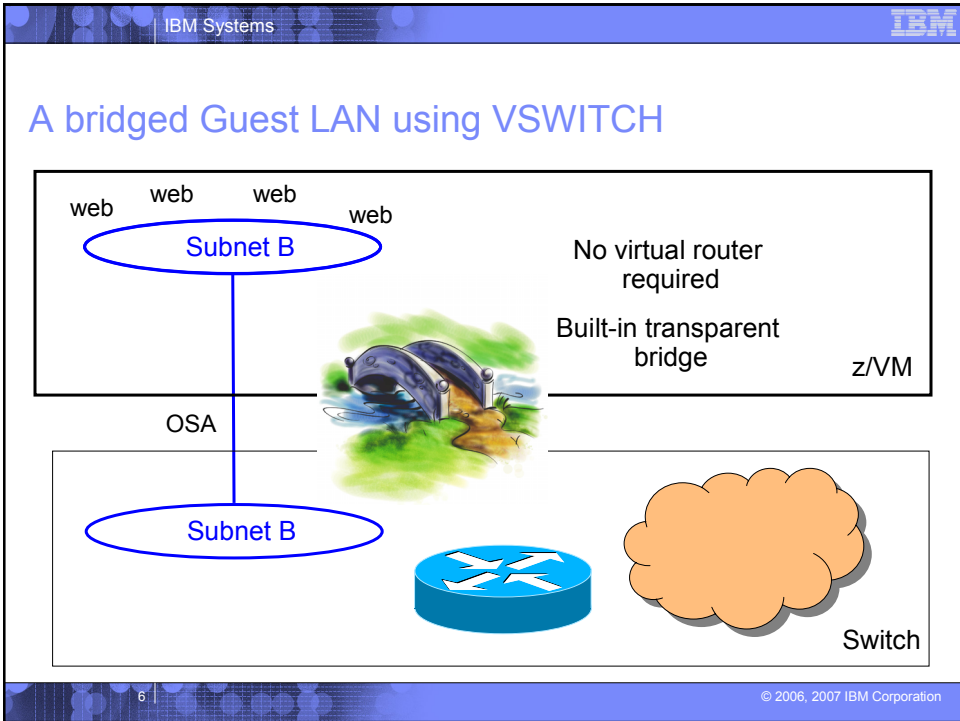
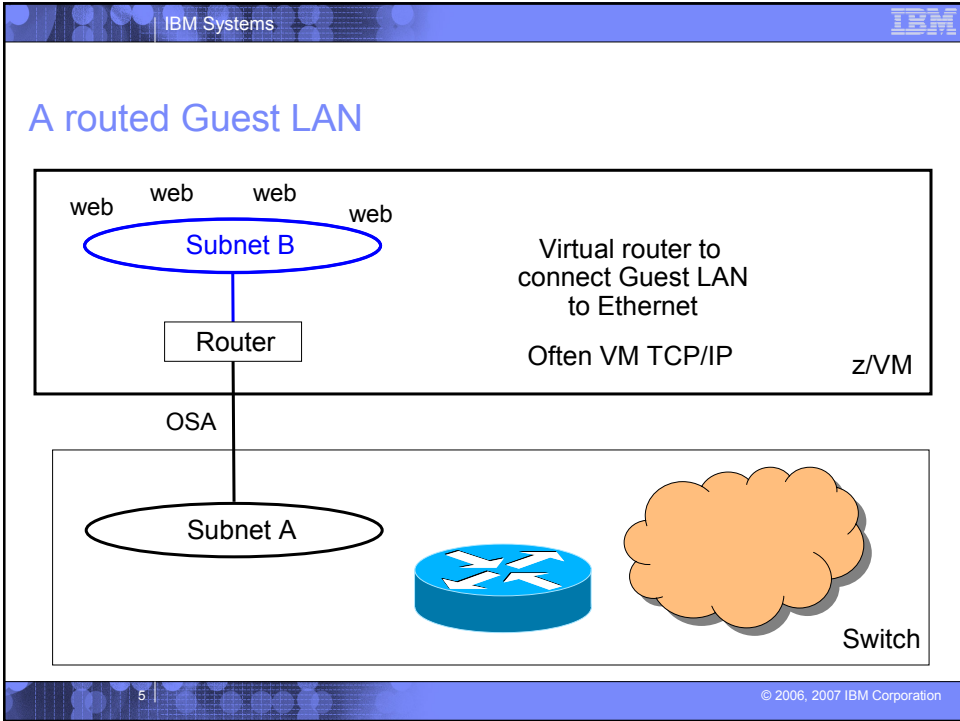
Topics

- Routing vs. Bridging
- What's a switch?
- VLAN-unaware migration
- VLAN-aware migration

Review: Guest LAN vs. Virtual Switch



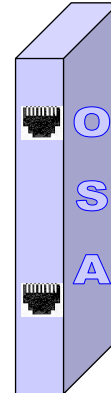
- | | |
|------------------------------|-----------------------|
| ▪ Virtual router is required | ▪ No virtual router |
| ▪ Different subnet | ▪ Same subnet |
| ▪ External router awareness | ▪ Transparent bridge |
| ▪ Guest-managed failover | ▪ CP-managed failover |



What's a switch?

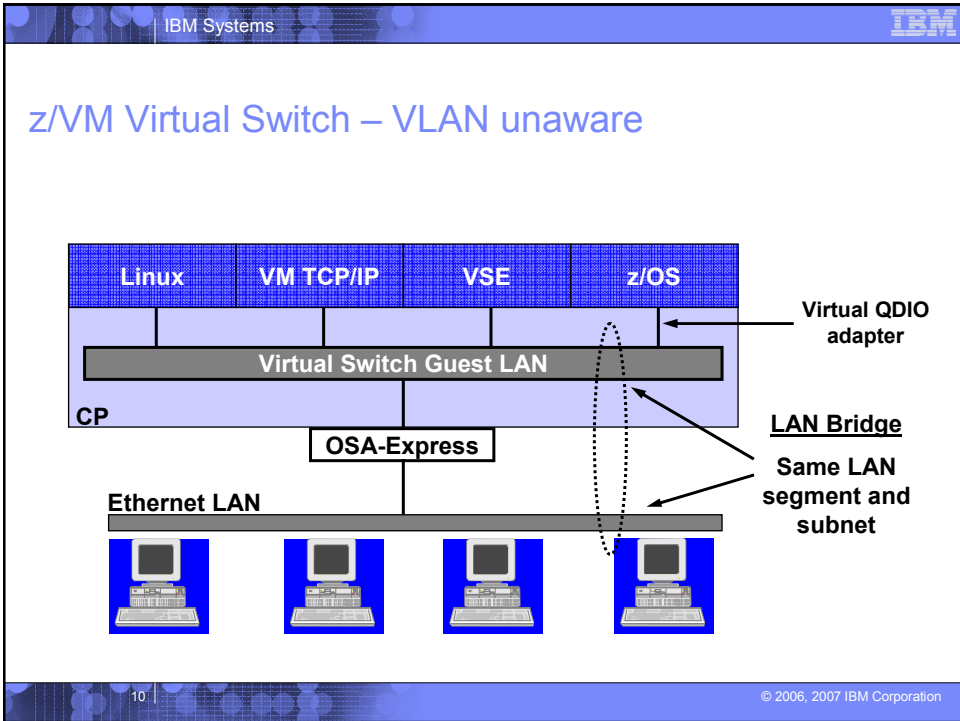
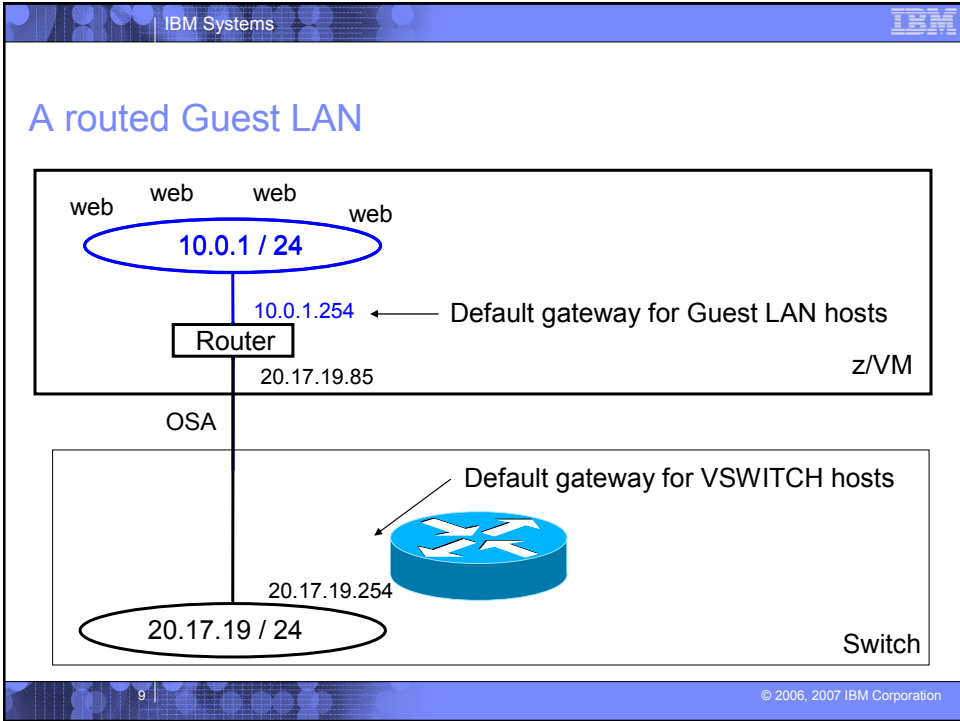


- ▶ A box that creates a LAN
- ▶ It can be remotely configured
 - ▶ E.g. Turn ports on and off
- ▶ Contains a built-in router



Switch functions

- Enable and disable a port
- Set port type: trunk or access
- Assign port to one or more VLANs
- Set port speed: 10 / 100 / 1000 / Auto
- Set port duplex mode: Simplex / Duplex / Auto
- Define an internal router
- Define SNAP (sniffer) ports



Current Configuration

Current Cisco 6509 Switch Configuration

- OSA is plugged into **port 7** of **slot 2**
- Port is defined as an **access** port
 - VLAN **unaware** host
- Port is currently assigned to **VLAN 201**
 - While in **ENABLE** mode:

```
#set vlan 201 name vlan201 mtu 1500
#set vlan 201 2/7
```
 - While in **CONFIG** mode:

```
#interface vlan 201
#ip address 20.17.19.254 255.255.255.0
```

CP – SYSTEM CONFIG

```
DEFINE LAN WEBNET TYPE QDIO RESTRICTED  
MODIFY LAN WEBNET GRANT LINUX001  
MODIFY LAN WEBNET GRANT LINUX002  
MODIFY LAN WEBNET GRANT LINUX003  
MODIFY LAN WEBNET GRANT LINUX004  
MODIFY LAN WEBNET GRANT TCPIP
```

VM TCP/IP directory

```
USER TCPIP XXXXXXXX 32M 128M ABG  
:  
* Guest LAN  
NICDEF E00 TYPE QDIO LAN SYSTEM WEBNET  
* OSA  
DEDICATE C200 C200  
DEDICATE C201 C201  
DEDICATE C202 C202  
:
```

VM TCP/IP Profile

```
; Syntax is z/VM 5.2
; eth0 is the external OSA
DEVICE ETH0 OSD C200
LINK   ETH0 QDIOETHERNET ETH0 MTU 1500

; eth1 is Guest LAN
DEVICE ETH1 OSD E00
LINK   ETH1 QDIOETHERNET ETH1 MTU 1500

HOME
    20.17.19.85/24   ETH0
    10.0.1.254/24   ETH1

GATEWAY
    defaultnet 20.17.19.254 ETH0 0
```

Linux directory entry

```
USER LINUX002 XXXXXXXX 128M 2048M G
:
* Guest LAN
NICDEF C204 TYPE QDIO LAN SYSTEM WEBNET
:
```


Linux configuration - network

- `ifconfig eth0 10.0.1.5 mask 255.255.255.0 mtu 1500`
- `route add default gw 10.0.1.254`

New Configuration #1

Methodology #1

- Create a new VLAN in the Cisco switch to carry the subnet being moved
- Associate the OSA with the new VLAN
- Add a new router to the switch
- Delete the router from z/VM
- Connect the VSWITCH

Cisco Catalyst 6509 (running CatOS)

- While in ENABLE mode:

```
#set vlan 202 name webnet mtu 1500
#set vlan 202 2/7
```
- While in CONFIG mode:

```
#interface vlan 202
#ip address 10.0.1.254 255.255.255.0
```
- If you do not have a router function in your switch
 - ▶ add another interface on your router
 - ▶ plug it into another port
 - ▶ add the new port to vlan 202

CP – SYSTEM CONFIG

* from Guest LAN..

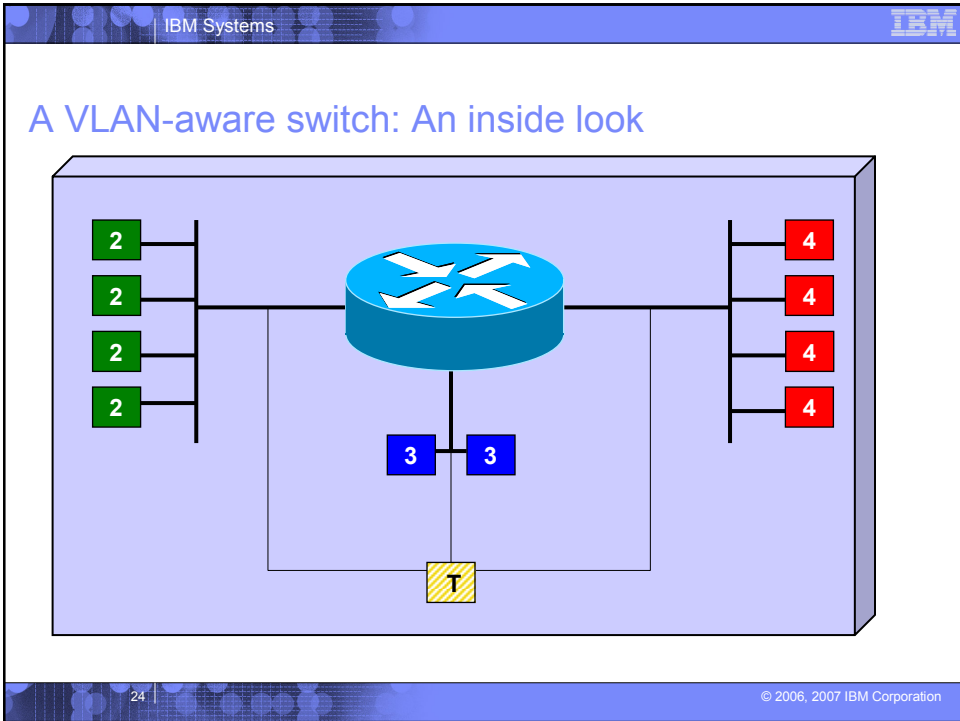
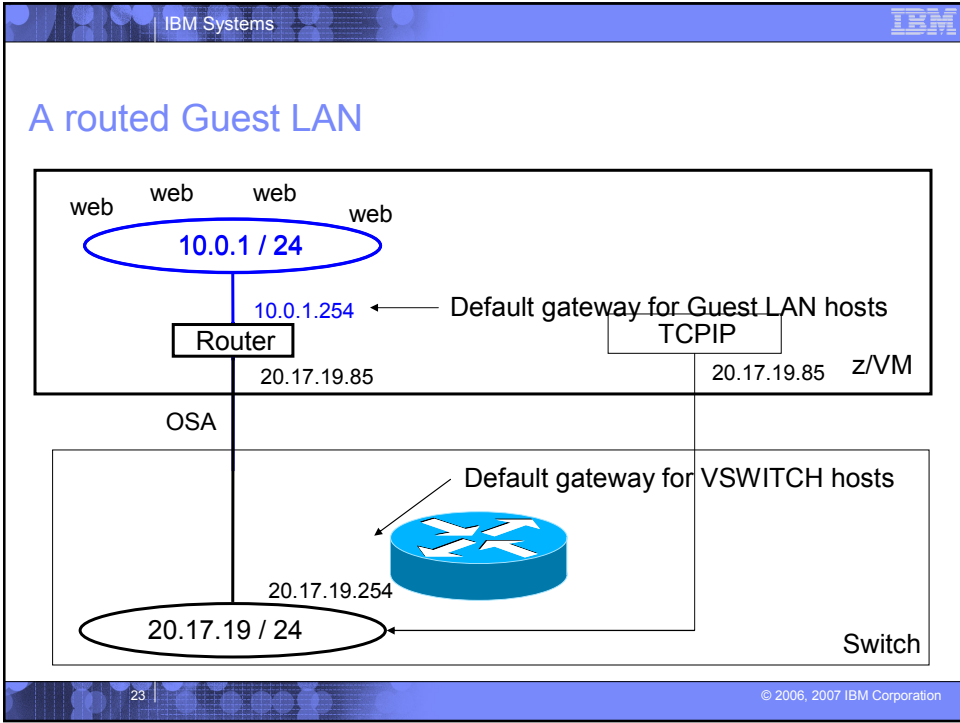
```
DEFINE LAN WEBNET RESTRICTED TYPE QDIO  
MODIFY LAN WEBNET GRANT LINUX001  
MODIFY LAN WEBNET GRANT LINUX002  
MODIFY LAN WEBNET GRANT LINUX003  
MODIFY LAN WEBNET GRANT LINUX004  
MODIFY LAN WEBNET GRANT TCPIP
```

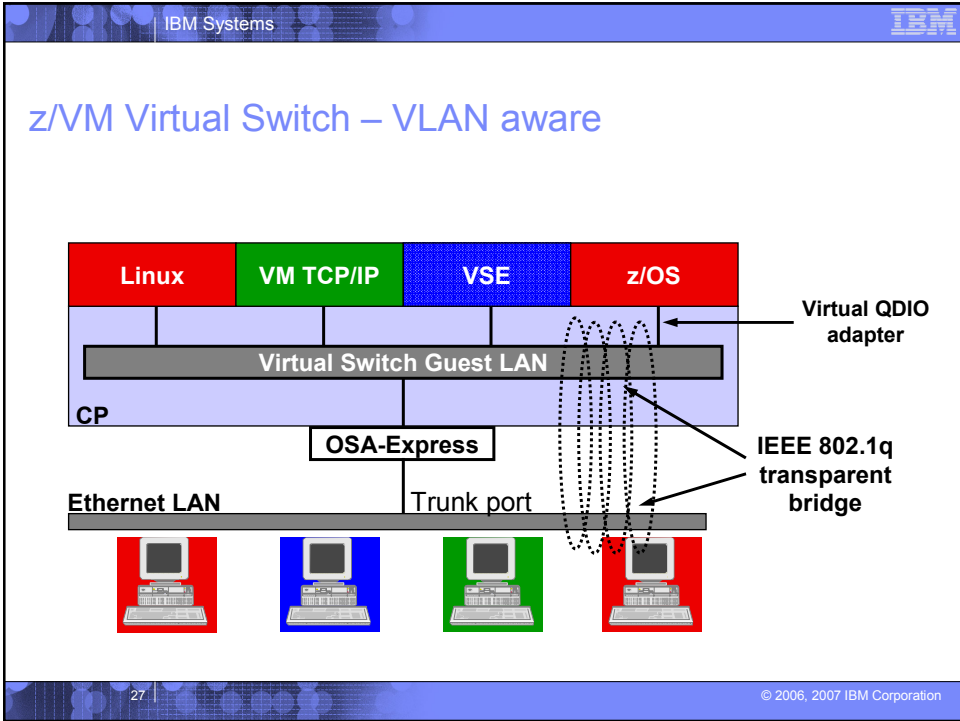
* ...to VLAN-unaware VSWITCH

```
DEFINE VSWITCH WEBNET RDEV C200  
MODIFY VSWITCH WEBNET GRANT LINUX001  
MODIFY VSWITCH WEBNET GRANT LINUX002  
MODIFY VSWITCH WEBNET GRANT LINUX003  
MODIFY VSWITCH WEBNET GRANT LINUX004
```

Note that TCPIP is
not in the access
list on the
VSWITCH

**But I want to
keep TCP/IP...**





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New Configuration #2

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Methodology #2

- Use a single OSA port to carry traffic for both VM TCP/IP and the Linux guests
- Use a VLAN-aware VSWITCH
- Add a new router to the switch
- Allow VLAN tags for both subnets to flow on the OSA port

CP – SYSTEM CONFIG (z/VM 5.2)

```
* from a Guest LAN...
DEFINE LAN WEBNET RESTRICTED TYPE QDIO
MODIFY LAN WEBNET GRANT LINUX001
MODIFY LAN WEBNET GRANT LINUX002
MODIFY LAN WEBNET GRANT LINUX003
MODIFY LAN WEBNET GRANT LINUX004
MODIFY LAN WEBNET GRANT TCPIP

* ...to a VLAN-aware VSWITCH z/VM 5.2
DEFINE VSWITCH WEBNET RDEV C200 VLAN 1
MODIFY VSWITCH WEBNET GRANT LINUX001 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX002 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX003 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX004 VLAN 202
MODIFY VSWITCH WEBNET GRANT TCPIP VLAN 201
```

The native VLAN id of the switch should match the VLAN specified on DEFINE VSWITCH

CP – SYSTEM CONFIG (z/VM 5.3)

* from a Guest LAN..

```
DEFINE LAN WEBNET RESTRICTED TYPE QDIO
MODIFY LAN WEBNET GRANT LINUX001
MODIFY LAN WEBNET GRANT LINUX002
MODIFY LAN WEBNET GRANT LINUX003
MODIFY LAN WEBNET GRANT LINUX004
MODIFY LAN WEBNET GRANT TCPIP
```

* ...to a VLAN-aware VSWITCH z/VM 5.3


```
DEFINE VSWITCH WEBNET RDEV C200 VLAN 202 NATIVE 1
MODIFY VSWITCH WEBNET GRANT LINUX001
MODIFY VSWITCH WEBNET GRANT LINUX002
MODIFY VSWITCH WEBNET GRANT LINUX003
MODIFY VSWITCH WEBNET GRANT LINUX004
MODIFY VSWITCH WEBNET GRANT TCPIP VLAN 201
```

Cisco Catalyst 6509 running CatOS

- While in ENABLE mode:

```
#set vlan 202 name webnet mtu 1500
#set trunk 2/7 on dot1q 1,201-202
```
- While in CONFIG mode:


```
#interface vlan 202
#ip address 10.0.1.254 255.255.255.0
```
- If you do not have a router function in your switch
 - ▶ add another interface on your router
 - ▶ plug it into another port
 - ▶ add the new port to vlan 202

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VM TCP/IP directory

```
USER TCPIP XXXXXXXX 32M 128M ABG
:
* Virtual Switch
NICDEF C200 TYPE QDIO LAN SYSTEM WEBNET
```

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VM TCP/IP Profile

```
; Syntax is z/VM 5.2
; eth0 is the external OSA
DEVICE ETH0 OSD C200
LINK ETH0 QDIOETHERNET ETH0 MTU 1500

HOME
    20.17.19.85 255.255.255.0 ETH0


GATEWAY
    defaultnet 20.17.19.254 ETH0 0
```

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Conclusion

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Summary

- Conversion is relatively easy
- Draw pictures
- There are choices:
 - ▶ Separate OSA ports, each assigned to a separate VLAN
 - ▶ A single OSA port that trunks multiple VLANs
 - ▶ A combination

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Contact Information

- By e-mail: Alan_Altmark@us.ibm.com
- In person: USA 607.429.3323
- On the Web: <http://ibm.com/vm/devpages/altmarka>
- Mailing lists: IBMTCP-L@vm.marist.edu
IBMVM@listserv.uark.edu
LINUX-390@vm.marist.edu

<http://ibm.com/vm/techinfo/listserv.html>