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VM/Advanced Network Services

A New Reference Architecture for VM TCP Services

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Problem Overview

- Services dated in terms of function and capability
- Unable to quickly assimilate and deploy new services and functions
- VM TCP perceived to be complex to set up
- Linux hosting strategy complicated by host-orientation vs network-orientation

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Impact

- Perceived as additional barrier to Linux on zSeries adoption
- Perceived as insecure/antiquated
  - Most VM systems attached to the public Internet are in popular RBLs as risk to public infrastructure
- Complicates L2 adoption strategy
- Complicates HW assist implementation

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Proposal Overview

- Use Linux-based appliances to replace existing CMS services
  - Use existing code to support legacy services where public interfaces are not available
- Add new multi-platform functionality
- Ship a fully-configured system requiring only minimal setup

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Design Overview

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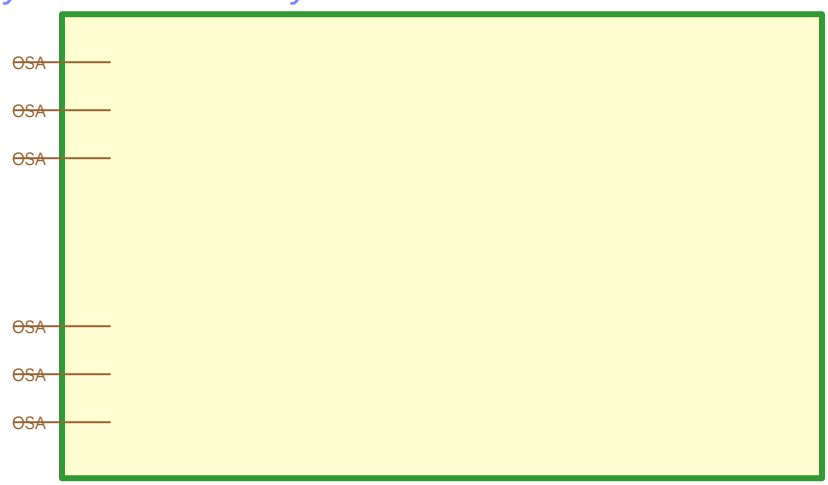
Physical Connectivity



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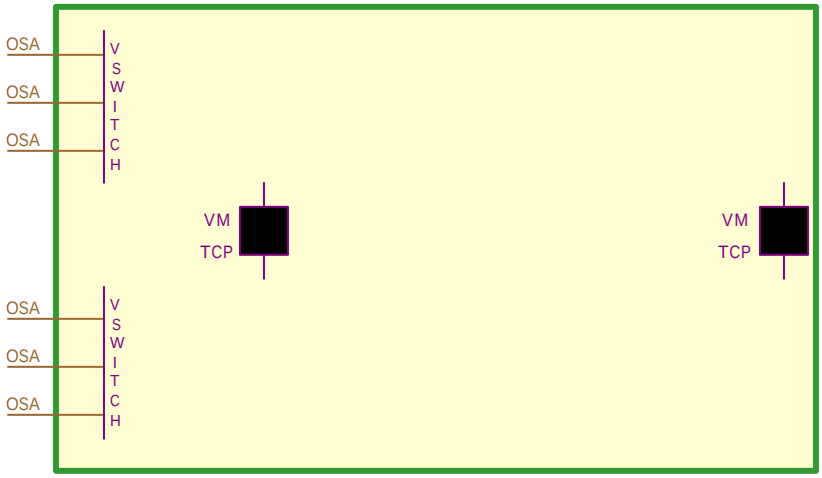
VSWITCH Controllers



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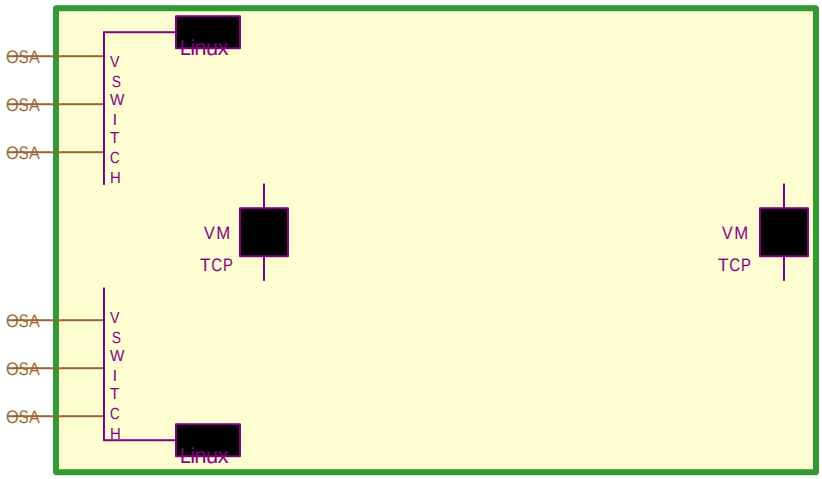
Linux Guest Networking



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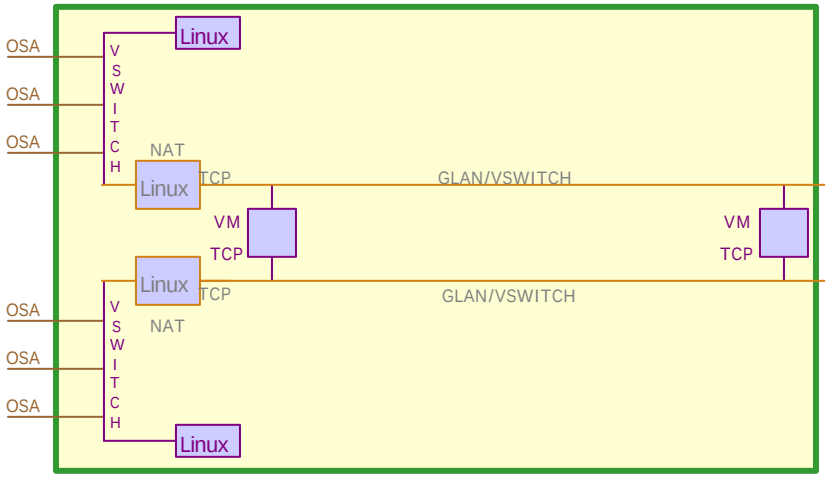
VM TCP Connectivity



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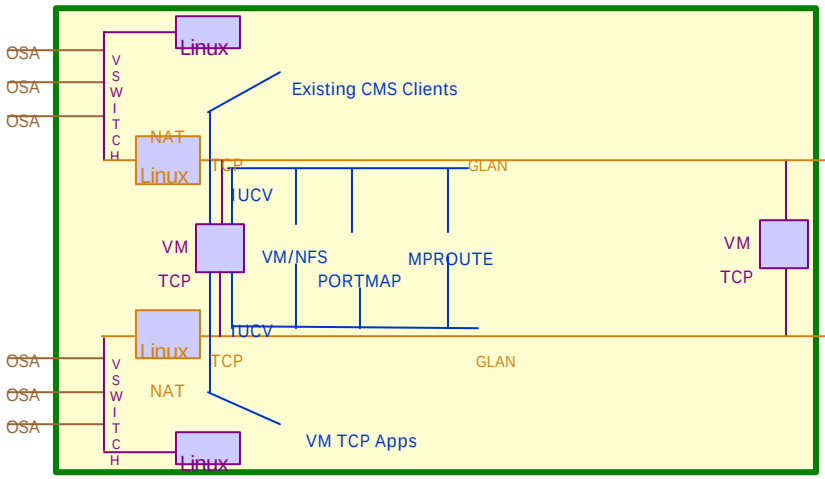
Existing CMS TCP Applications



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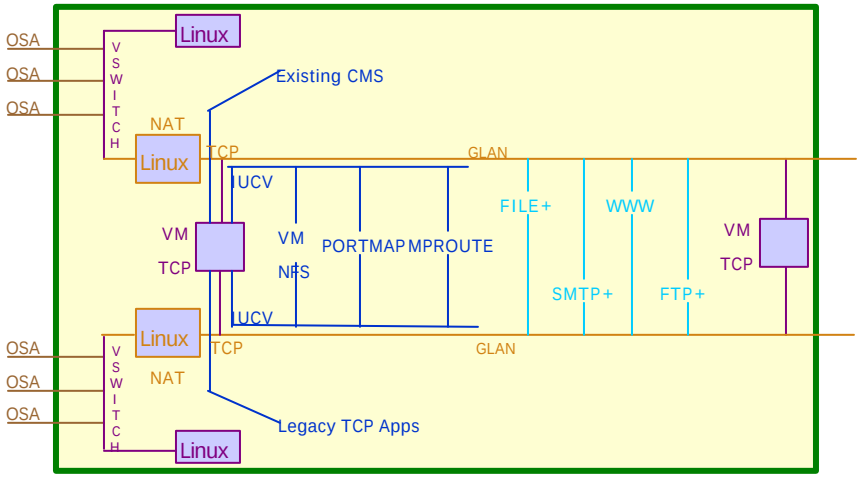
Modern Applications



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New Function

- Packet Filtering
- Traffic Shaping
- Traffic Authentication
- SMB/NFSv4 Support
- FTP Checkpoint
- Grid Services Support
- Full redundancy in default implementation
- Robust Cisco-style routing implementation
- WWW Server
- "Couple and Go" Support for Guests
- Spam/virus scanning
- RBL support
- Full DNS implementation w/o DB2
- Easy implementation of new protocols
- Kerberos support in tools
- LDAP Server

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Backward Compatibility

- Completely backward compatible
  - CMS clients continue to communicate with VM TCP as interim step
  - Support for migration to complete Linux stack when AF_IUCV support completed and tested in Linux NAT appliance
  - Conversion tools to migrate existing configuration partially done
    - SMTP (100%)
    - FTP (100%)

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New Services/APIs

- IPP support (via CUPS/lpr and RSCS)
- Kerberos 5
- LDAP
- HTTP
- WWW based configurator
  - TCP services
  - VM management (later)
- User SNMP proxy/ integration
- TCPwrappers
- Outbound SSL (predefined ports)
- Crypto Engine exploitation (if present) in SSL

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Documentation

- Current weak point
  - Design: completed
  - Application manuals: completed
  - Messages & Codes: pending
  - Built to Unix standard

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Maintenance

- Total replacement service
- Kernel in NSS, /usr in DCSS
- User configuration data on individual disk attached to service machine
  - Editable from Linux or CMS
  - Working on WWW configurator

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Performance

- No additional impact to Linux guests attached to VSWITCH
- CMS users average 3-5% throughput impact due to NAT processing (prototype on MP3K)
- Approx 10% increase in disk footprint over existing TCP stack (in prototype)

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Completeness

GW+	100%
SMTP+	100%
FTP+	100%
FILE+	100%
LDAP+	90%
WWW+	90%
IPP+	100%
Configurator	80%
Documentation	70%

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Benefits

- Simplifies VM TCP configuration to supplying a minimum of 1 IP address, netmask, default gw and DNS server
- Allows shipping completely configured, fully redundant services behind GW servers
- Promotes "building blocks" support services for Linux farms
- Provides modern secure services for CMS users w/o significant development

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Summary

- The work done so far has endured almost 9 months of production use, and is mature and stable.
- Using the appliance approach, we can rapidly design and implement compatible function for both Linux and CMS users with a minimum of effort and time
- If desired, additional appliances can be quickly implemented. Requests are being taken…8-)

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Q&A

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