

The Twelve Pillars of IBM z/VM System Management

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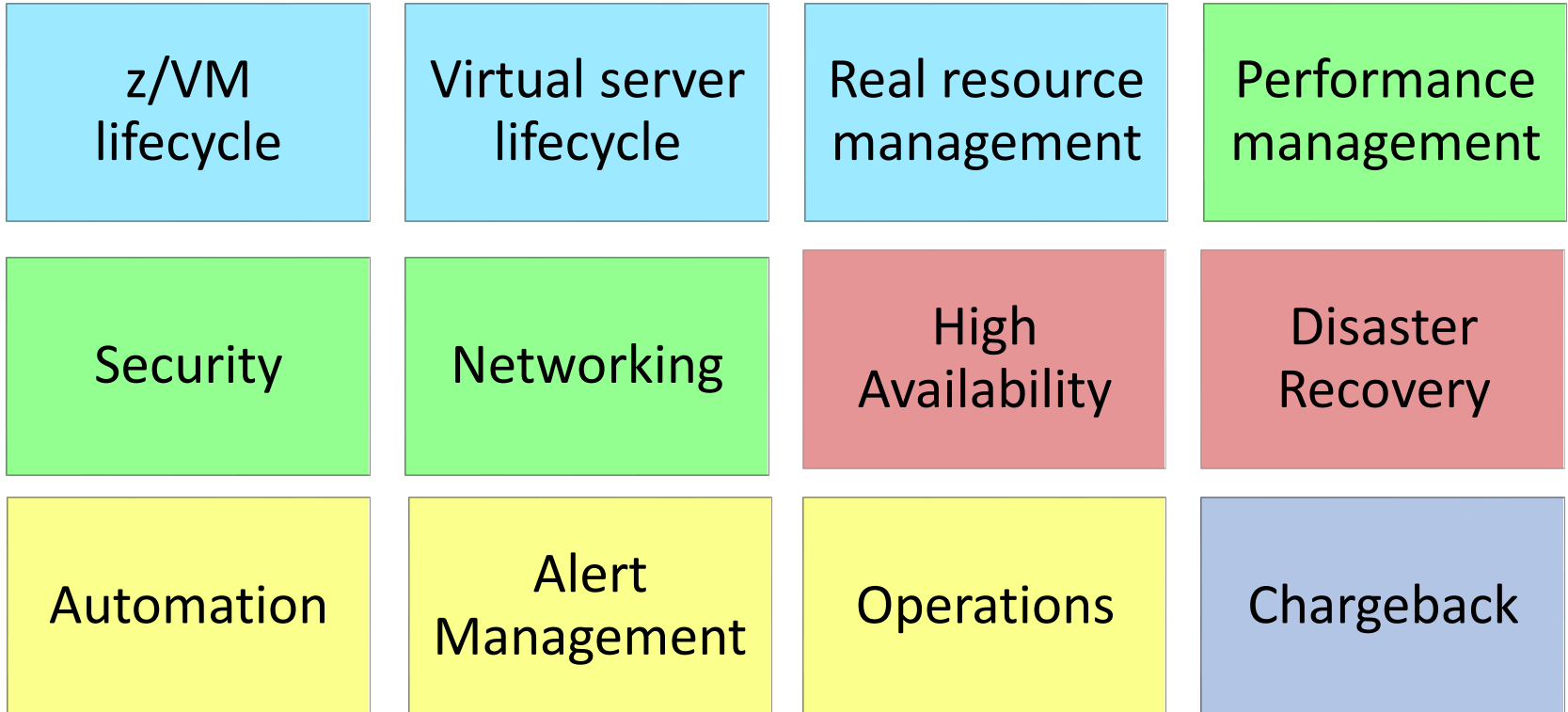
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OK, so they're more like rectangles....



z/VM Hypervisor Lifecycle

- Installation
 - System cloning
 - Customization
 - Patching: RSU, COR, SPE, fix-test
 - PSP bucket
 - System upgrades
 - Decommission
-
- Practice, practice, practice dumps and patches
 - Once a quarter
 - You never know when you'll need it in a hurry!

z/VM Hypervisor Lifecycle

- Recommended Service Upgrade (RSU)
 - Selected preventive service PTFs
 - Cumulative
 - Executables pre-built
 - Conservative content
- Corrective service
 - Individual PTFs
 - Fix-test for an open APAR
 - Needed to be current
- New Function (NF) APARs
 - Shipped as COR service
 - MAY eventually be placed on RSU

Virtual Server Lifecycle

- Virtual machines
 - Naming conventions
- Provisioning
 - Add / Change / Delete
 - Directory manager (e.g. DIRMAINT)
 - ICP, IBM wave
- Operations
 - Start / Stop / Pause / Move

Real Resource Management

- Memory and CPU
 - Can resources be moved or are they tied to the partition?
- Dynamic I/O changes
 - IODF creation, distribution, and activation
 - HCD v. HCM v. DPM v. z/OS
- Hardware upgrades (concurrent or off/on)
- Storage migration
- Threshold and status alerts (operator)

Performance Management



- Performance management
 - Real-time
 - Historical
 - Capacity planning
 - Advisories
 - Threshold and status alerts
- Performance Toolkit: Web, 3270
- OMEGAMON
- zVPS

Security - Policy



- Policy is a **roadmap** for implementation
 - Multi-factor authentication?
 - Password phrases?
- What you are supposed to accomplish, not how
 - Follow on with an **implementation guide** that is z/VM specific
- Policy should avoid implementation-specific naming
 - “Must use the Foo Facility” can lock out platforms that have same functionality, but don’t call it “Foo”
- Virtualization services are substantially different from traditional OS services

Security - Operational



- Provisioning
 - Person or workload?
 - Naming convention v. Groups
 - Authorizations & privileges
- Emergencies & Error recovery
 - Break glass
 - Database failure
 - ESM failure

Security - Operational



- What to audit?
- Detecting configuration changes
- Penetration testing

Security - Data



- Encryption
 - In flight: TLS servers (no self-signed certs, please)
 - At rest: pervasive encryption
 - Upgrade your TN3270E clients
- Resource access controls
 - External security manager
 - Access rights review
 - Based on group membership
- Residual data management
 - Clear, purge, destroy



Networking

- TCP/IP and VSWITCH
 - Bridge, HiperSockets, VLANs
- Planning
- Bandwidth (capacity)
- Hardware (cables, ports, switches, power)
- Alert generation (failure, thresholds, drops)
- Dropped packet diagnostics

Networking

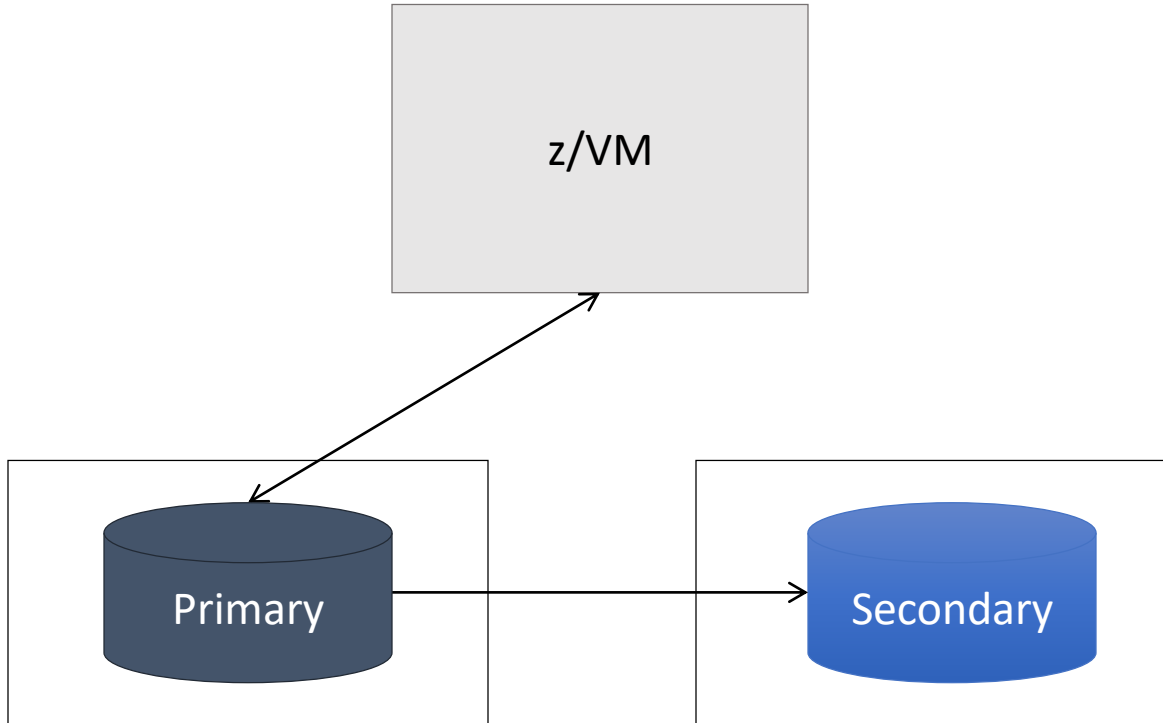


- “Just because it’s valid doesn’t mean it’s wise”
 - Sir Alan, Lord of the Protocols
- Configuration review
 - Backup port on same chpid
 - All OSAs plugged into same physical switch
 - Link aggregation / portchannel / bonding
- Vulnerability assessments
- Don’t forget about RoCE!

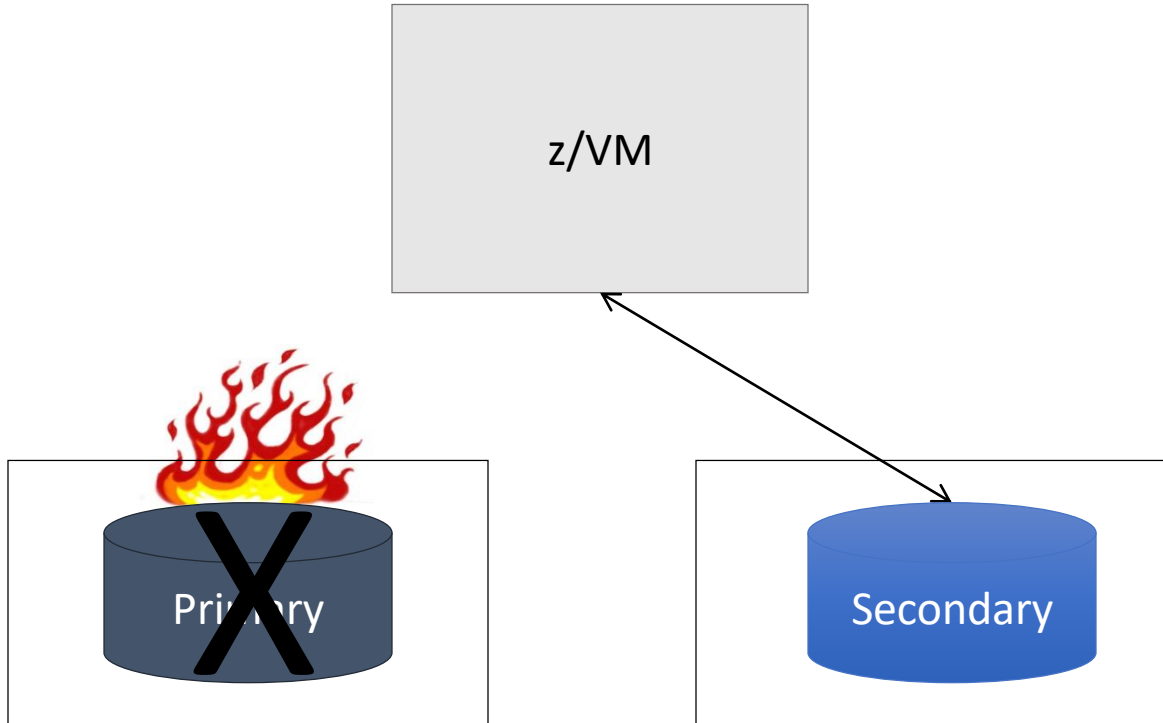
High Availability

- Single component outage
 - Planned or unplanned
 - Human or machine
- Clusters
 - Application, Database, Hypervisor, Server, Storage
 - All components eventually fail
- Storage mirrors: **GDPS®** and **hyperswap**
- Network link aggregation
- Alert generation (predictive, FYI, or unexpected)
- Archive / Retrieve (human failure)

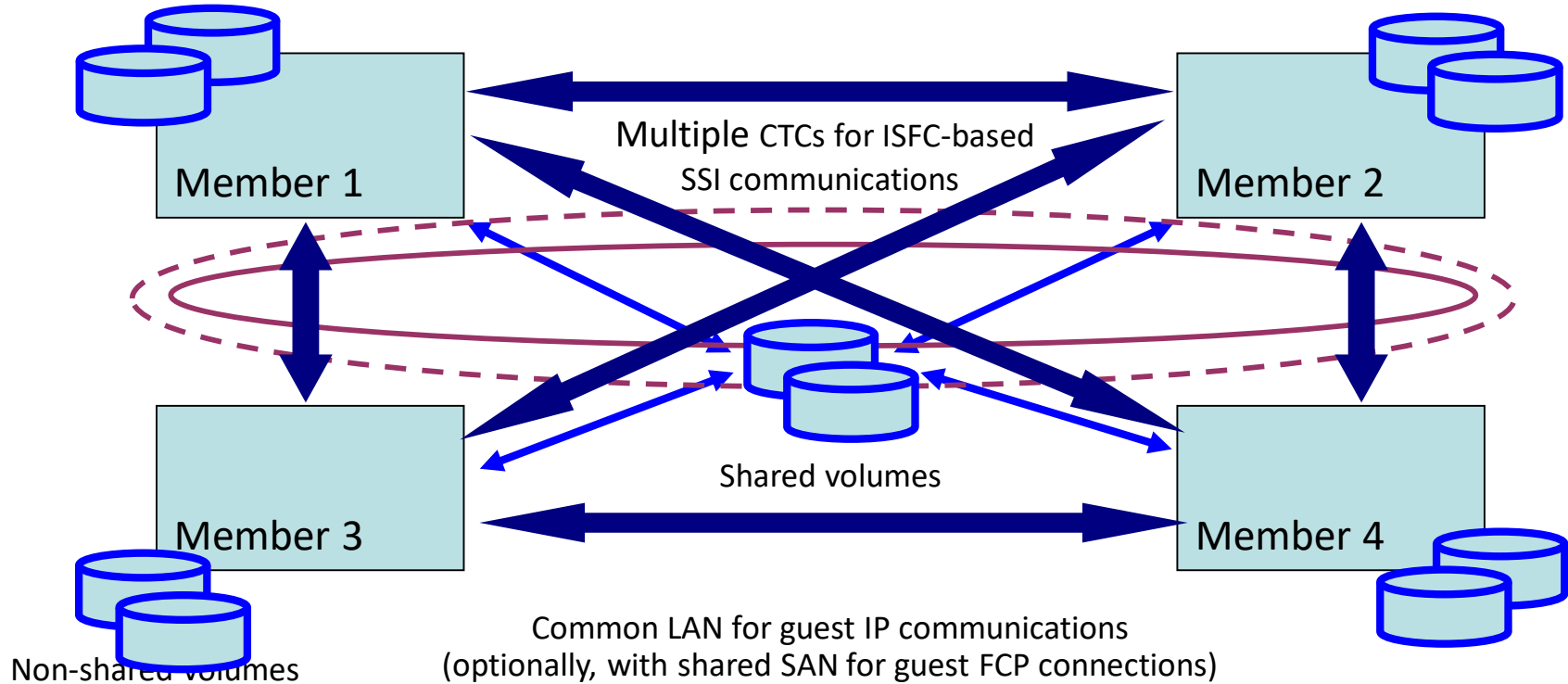
Hyperswap



Hyperswap



Single System Image



Disaster Recovery

- Multiple component failure
 - Includes complete site failure
- Asynchronous storage mirror
- Alternate machine, if you don't have another one nearby
- GDPS-managed **region swap**
- Alternate configuration management
 - Return home
 - Planned test
- Backup / Restore

Automation

- System operator console
 - Tourist information or Important?
 - Response to prompts (e.g. from security server)
 - Use SECUSER - don't run software IN the OPERATOR virtual machine
- Console log recording
 - All guests
 - Keep console data out of z/VM spool!
- Generate enterprise alerts
- File and command distribution
- Coordination of Flashcopy / Backup
- Startup / Shutdown staging and coordination with CP SIGNAL

Alert Management

- Performance
- User revocation (potential intrusion attempt)
- Predictive hardware failure
- FYI

- Enterprise event management integration
 - IBM, CA, HP, Microsoft,
 - Syslog forwarding
 - SNMP traps

- Locally generated e-mail

Operations

- IPL: Standalone program loader (SAPL)
 - LOADPARM
 - IPL parameters
 - SALIPL to set defaults
- SHUTDOWN / SHUTDOWN REIPL
- SNAPDUMP
- System restart full dump
- Stand-alone dump
- Practice, practice!

Operations

- HMC
 - Get your own ID
- OSA-ICC
 - “Gotta have it”
- Auto-IPL
- Recording: EREP (OFF), Symptom (OFF), ACCOUNT (if needed)
- Backup / Restore
- Service virtual machine (SVM) data collection and archive (sweep)

Chargeback

- Unit price per virtual server
- Unit price per CPU, disk, network
- Consumption (CPU) [hint: Don't do this!]
- Premium charge for premium service
- See OPERACCT for accounting records

- No requirement to bill
 - May be used to calculate TCO for comparisons
 - Not using? Then turn off ACCOUNT record recording.

The goal is in sight!

z/VM
lifecycle ✓

Virtual server
lifecycle ✓

Real resource
management ✓

Performance
management ✓

Security ✓

Networking ✓

High
Availability ✓

Disaster
Recovery ✓

Automation ✓

Alert
Management ✓

Operations ✓

Chargeback ✓

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Evaluations, please!