The Twelve Pillars of IBM z/VM System Management

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May 8, 2019

Notes

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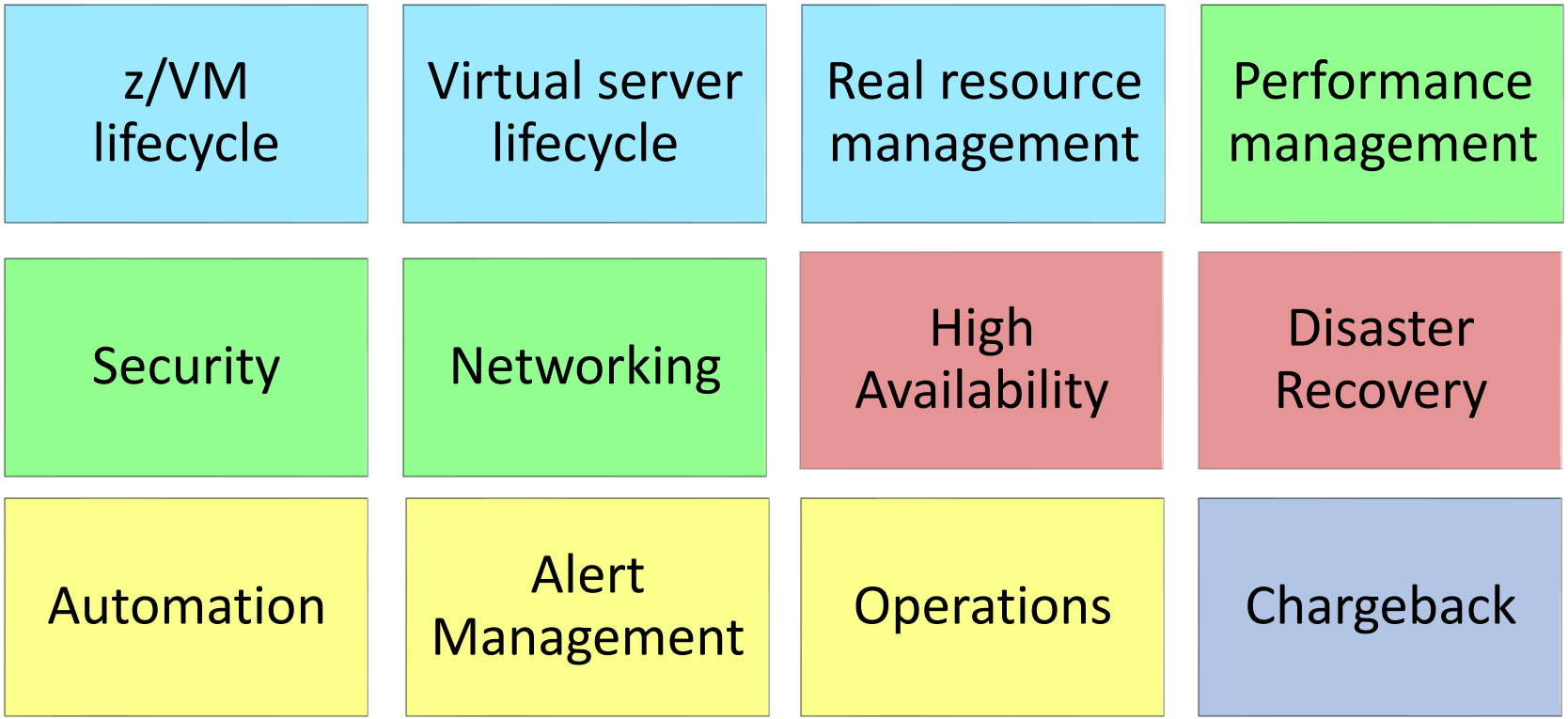
OK, so they're more like rectangles….



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
- Small Programming Enhancements (SPEs)
  - 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

- LPAR memory, CPU
- Dynamic I/O changes
  - IODF creation and activation
  - HCD v. HCM v. DPM
- Hardware upgrade (concurrent or off/on)
- Storage migration
- Threshold and status alerts (EREP, 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

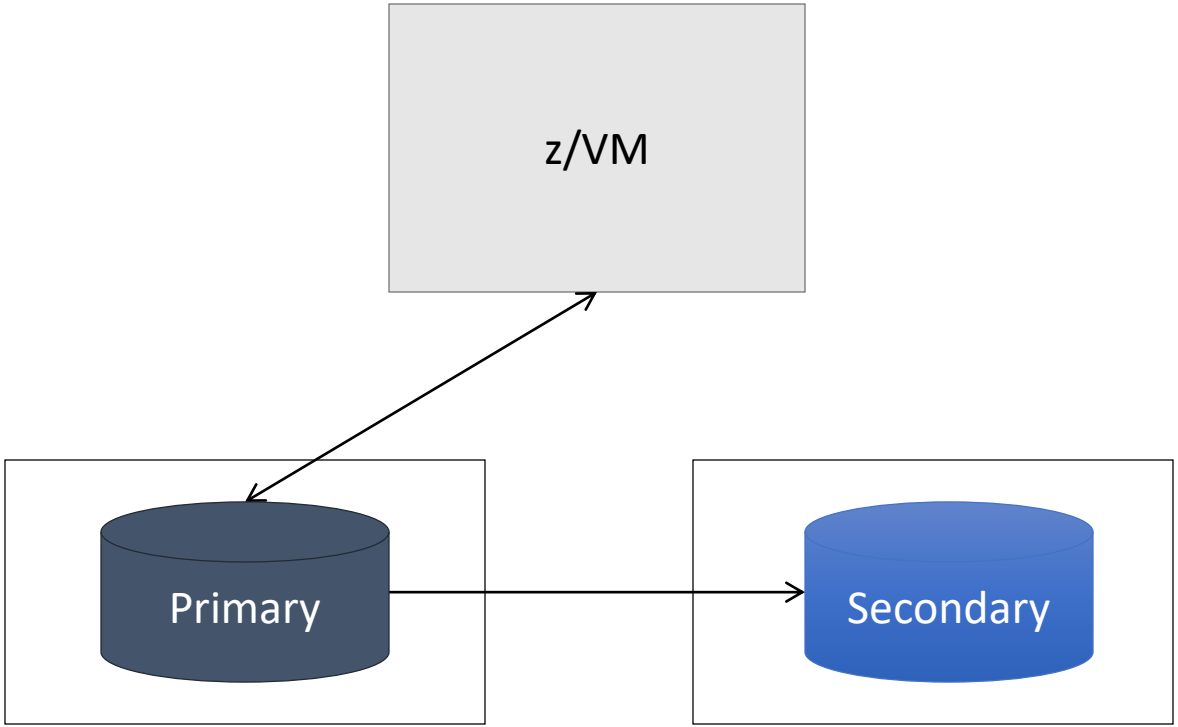
- Vulnerability assessments

- Don’t forget about RoCE!

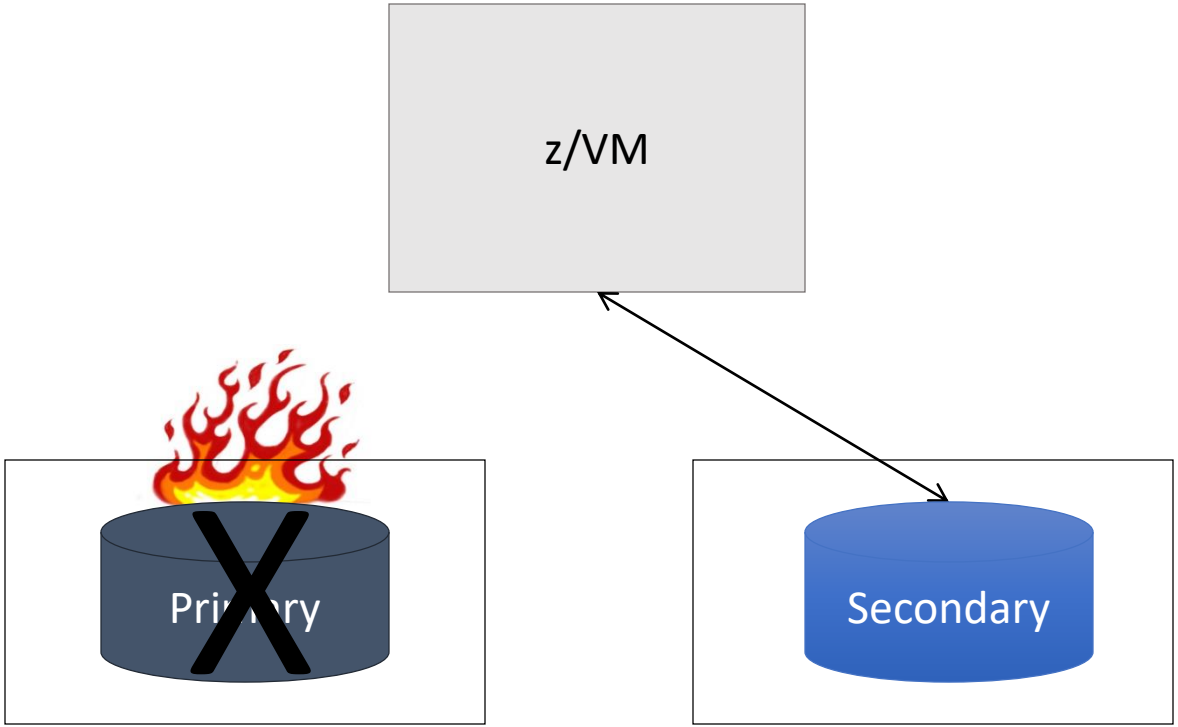
High Availability

- 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)

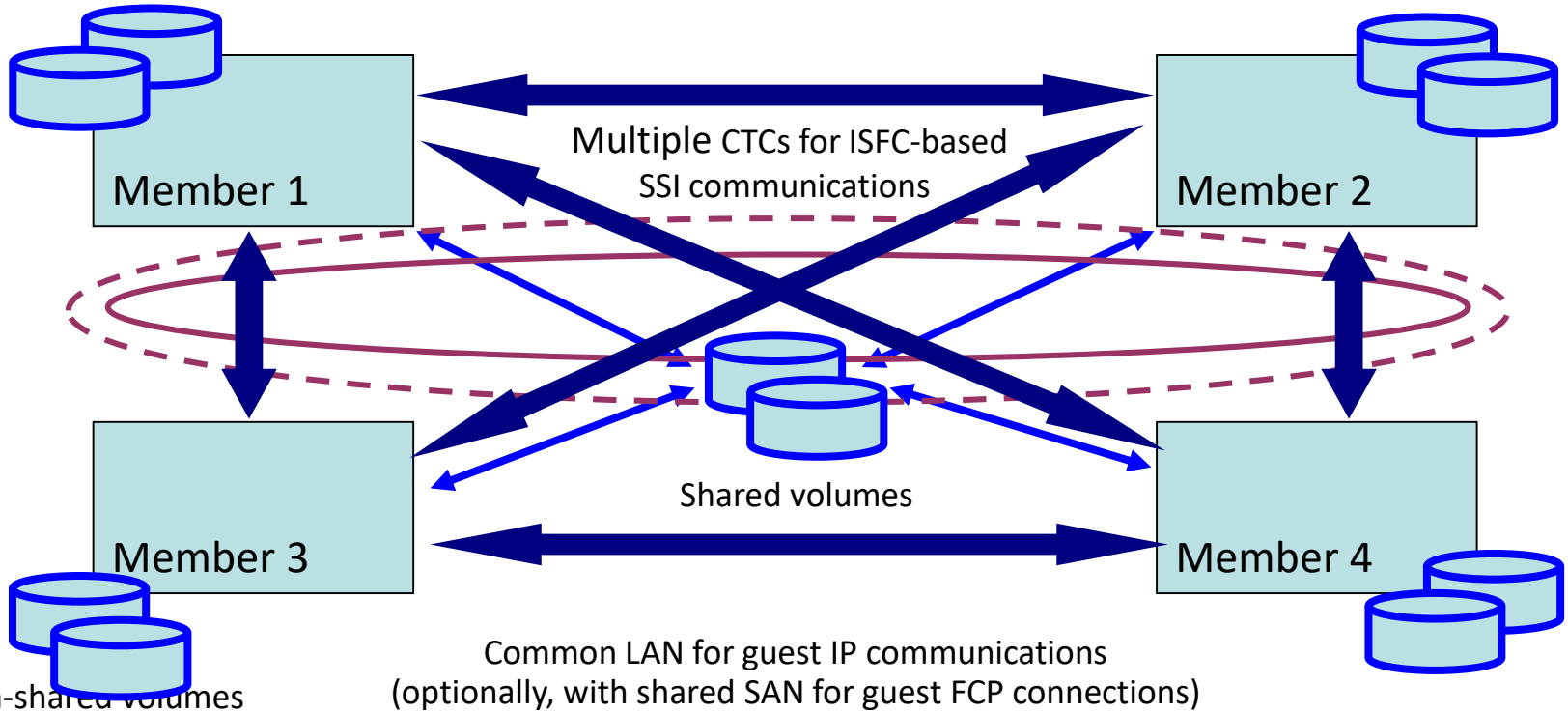
Hyperswap



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

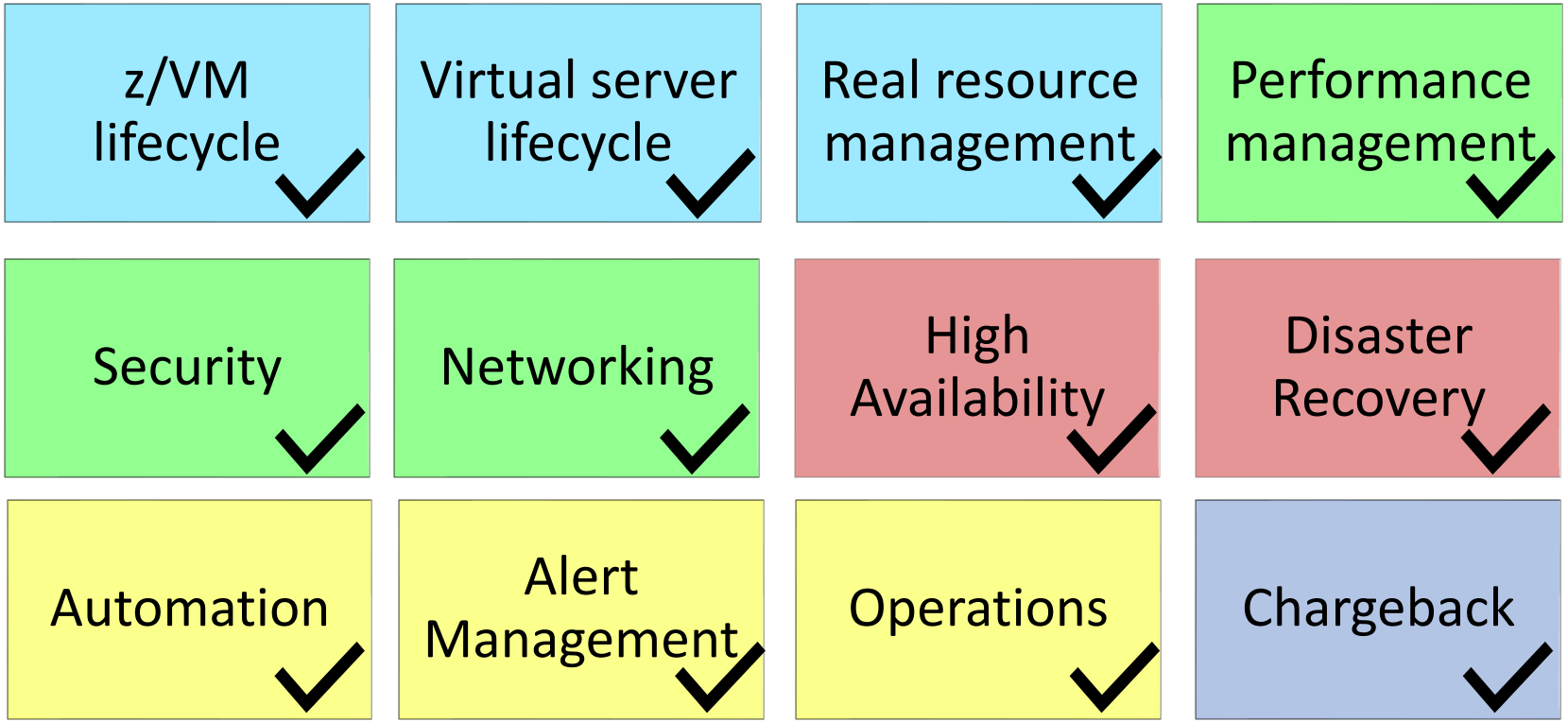
- HMC
  - Get your own ID
- OSA-ICC
  - “Gotta have it”
- Auto-IPL
- Recording: EREP (OFF), Symptom (OFF), ACCOUNT (if needed)
- Backup / Restore
- Service virtual machine (SVM) data collection and archive (sweep)

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!



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