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Redundancy of Mainframe vs Security

System Architecture



Agenda

- Who am I?
- Why System z?
- Why so much redundancy?
- What's the point of security?
- Redundancy vs Security
- Security vs Redundancy
- Questions

Who am I?

- julie@sysprog.co.uk
- 30 years in IBM Mainframes
- MVS Systems Programmer
 - with Security bias
- Author
 - CICS Essentials
 - z/Auditing Essentials
 - ISV Tech Docs
- Helping Customers to exploit bleeding edge technology on their IBM mainframes
- www.sysprog.co.uk



Who am I?

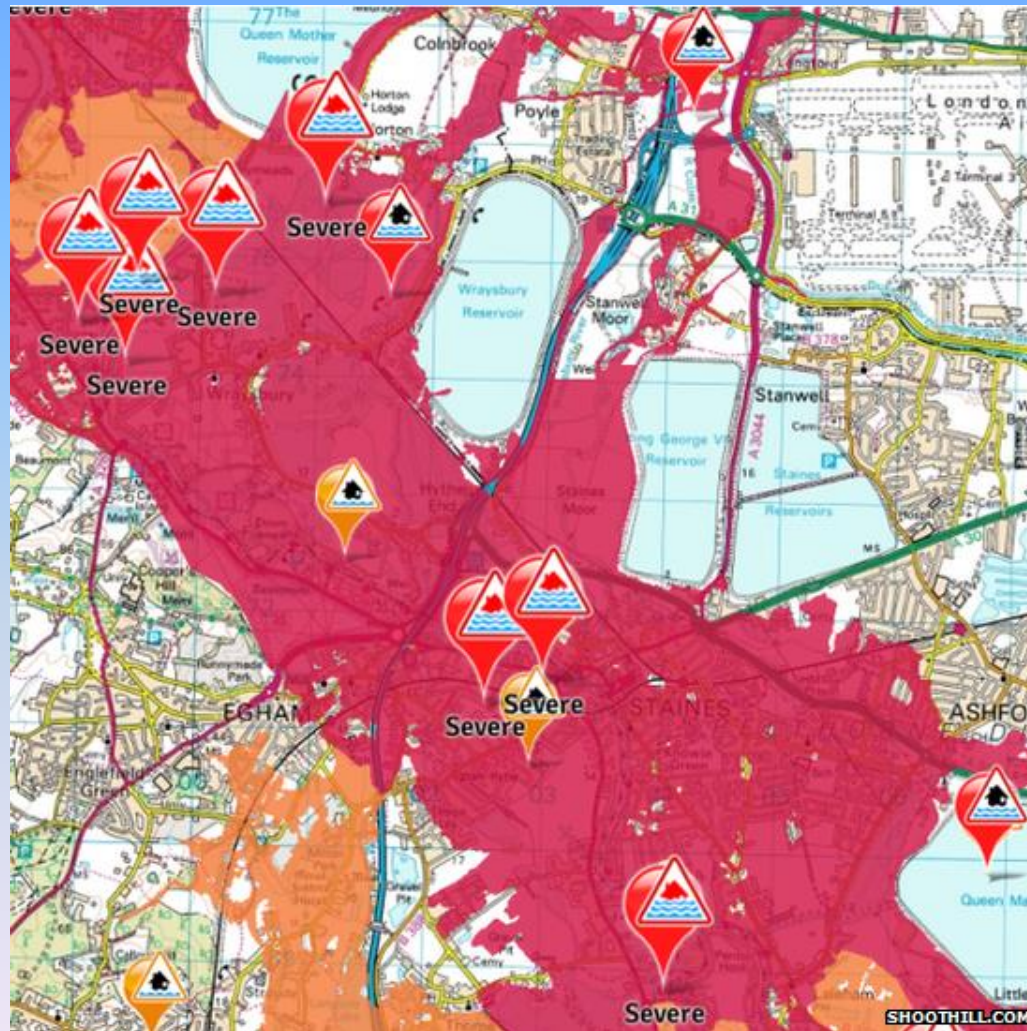


- Life outside of work...
 - Kat 3 was a wedge-shaped robot with a pneumatic axe
 - We competed in
 - Series 2-7 of Robot Wars
 - Robot Wars Extreme II
 - Robot Wars International
 - **Series 6 Sportsmanship Award** 😊
 - Also TechnoGames
 - The BBC's "Robotic Olympics"
 - We won a Silver medal in the football



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Why the delay?



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Why System z?

Marketing at the time led us to believe...

...z stands for zero down time!

Stability of systems primary design factor

- Business led
- 24x7 world
- Availability is critical
- Mean time between failures
 - 1000s of years!

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Why System z?

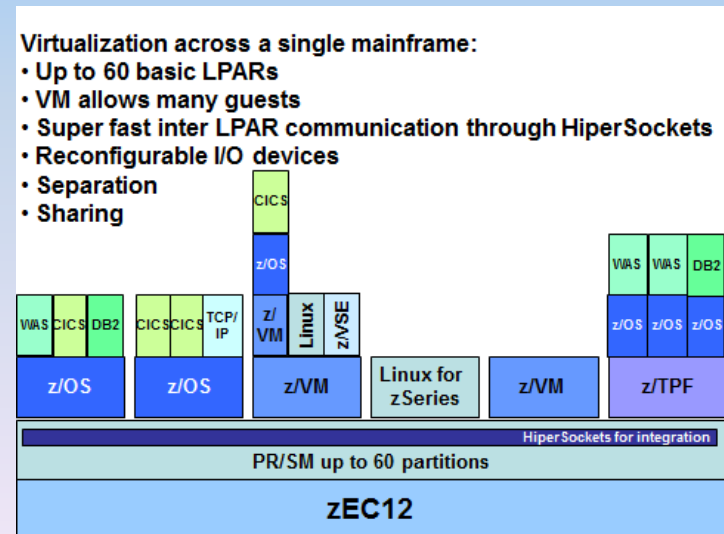
IBM zIQ -- Can you go five minutes without using a mainframe?



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Why so much redundancy?

- z/OS alone is a solid, business based operating system
- z/OS running in a parallel sysplex
 - Enables massive virtualisation
 - Data Sharing
 - Parallel processing
 - Sharing the workload
 - Leading to:
 - Fantastic availability (24x7)
 - Incredible performance
 - even Reduced power consumption!



Why so much redundancy?

- Guiding principal – No single point of failure
 - Duplicated hardware
 - Disk
 - Tape
 - Network access devices
 - Printers
 - etc
 - Duplicated paths
 - If in doubt, duplicate it!
 - Implemented using software/device configuration
 - Hot swappable parts/devices
 - Dynamically add:
 - Hardware
 - Storage
 - Memory
 - even operating system elements



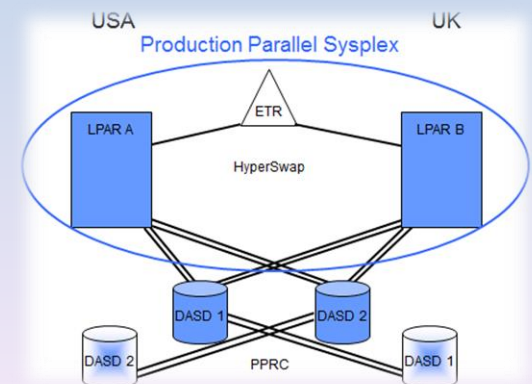
Why so much redundancy?

- IODF – Configuring the hardware for Redundancy
 - THE central point of control for the whole of a System z installation
 - Set of logical configuration statements used to define a network of hardware resources
 - includes things like which operating system configurations can be used, what DASD can be connected and how TCP/IP traffic is routed
 - Has a major effect on the integrity of the z/OS Sysplex and its images
 - correct device pathing
 - connections
 - efficient use of virtual storage
 - Etc
 - Incorrect coding could lead to:
 - IPL failures
 - Loss of access to subsystems
 - Inability to run critical business applications on System z!
 - For a much more detailed technical view of IODF:
www.redbooks.ibm.com/redbooks/pdfs/sg247804.pdf

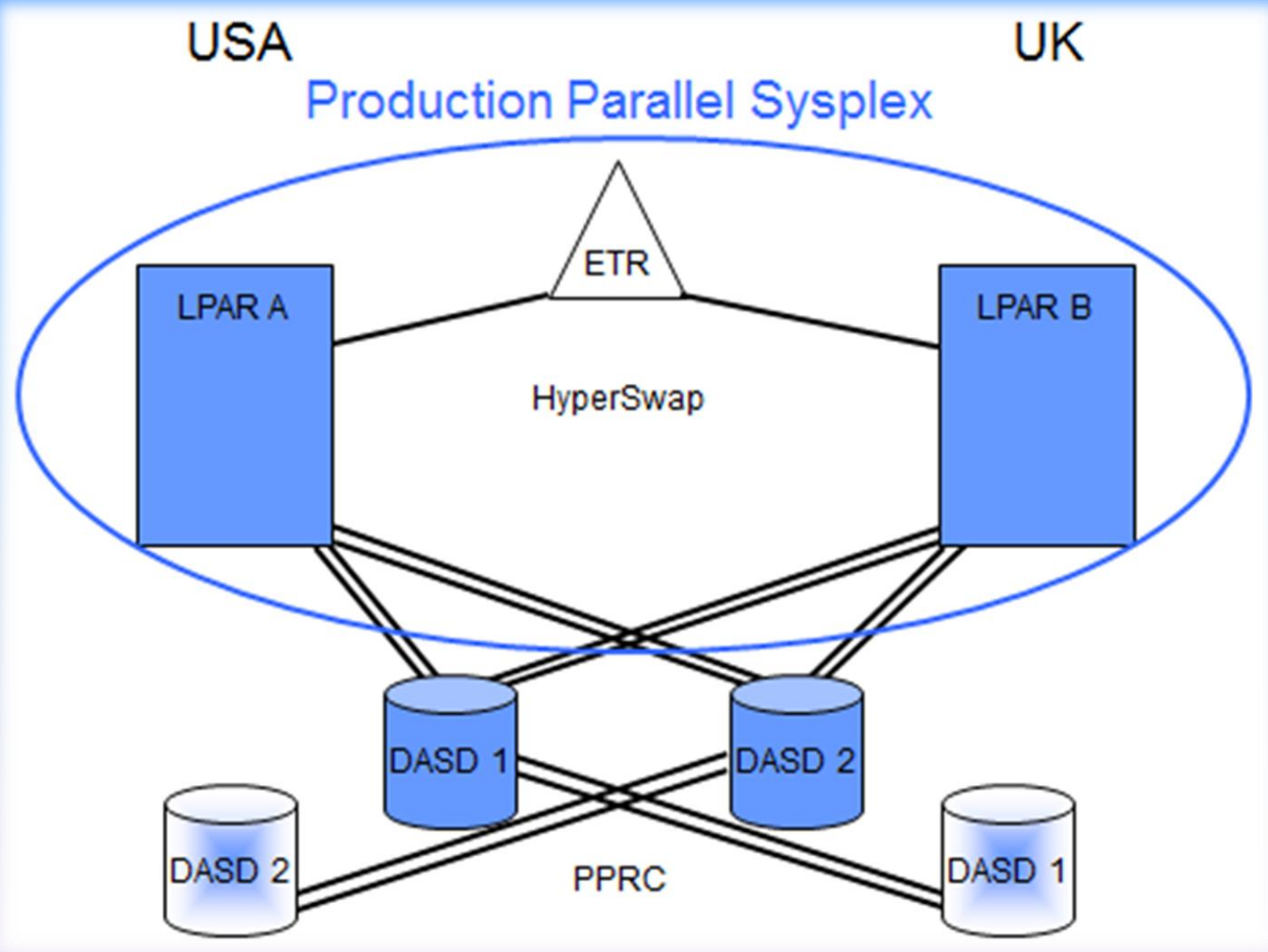


Why so much redundancy?

- What's a parallel sysplex?
 - A group of logical partitions configured to act together
 - On 1 or more physical mainframes
 - Farms out activity to whichever logical partition is ready for work
 - Does it have spare capacity?
 - Will running this work cause a performance hit to the whole system?
 - Returns results to user without them having to know where it ran
 - Uses a common timer to ensure synchronisation of events
 - Uses a Cross system Coupling Facility (XCF) to allow systems to communicate
 - Global Resource Serialization allows concurrent access to resources by all systems
 - only reducing to exclusive access where necessary



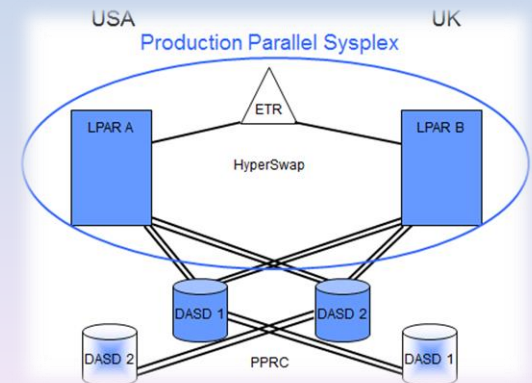
Why so much redundancy?



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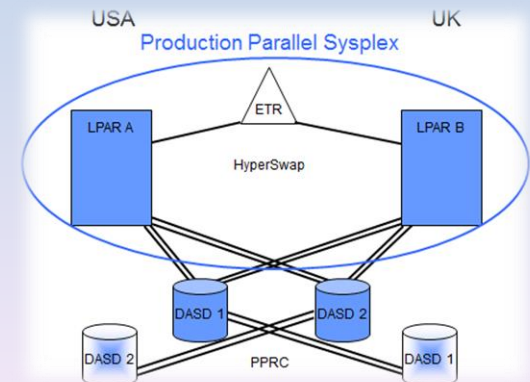
Why so much redundancy?

- GDPS – Globally Dispersed Parallel Sysplex
 - Described by IBM as:
 - The ultimate Disaster Recovery and Continuous Availability solution for a System z multi-site enterprise
 - Extends distance for massively parallel processing
 - Mainframes can be located in different buildings, cities or continents
 - Automation, as well as specialized hardware implementation, plays a large role in the recoverability aspects of GDPS



Why so much redundancy?

- GDPS – Globally Dispersed Parallel Sysplex
 - In synchronous data mirroring (GDPS/PPRC) mode there is a limit of 120 miles between sites
 - Enables “Hot Swap”
 - No loss of data/transactions
 - Expensive to implement
 - Asynchronous remote copy facility has no limit to distance between sites
 - Meaning mainframes can be in different countries or even different continents!
 - Enables “Warm Swap”
 - Some, potential, loss of data/transactions
 - Less expensive to implement

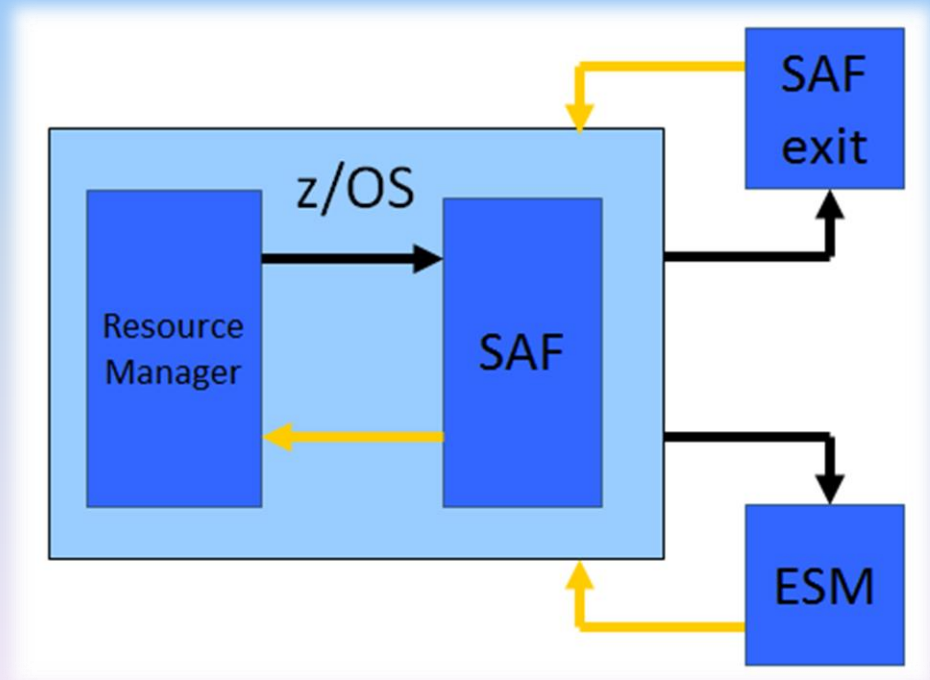


What's the Point of Security?

- Changes to the underlying system are required to operate BAU
 - Let alone upgrades to operating systems
 - Or patches to fix problems
 - Or replacing broken hardware
 - etc
- Changes to the underlying system can cause availability problems
 - If you can't start the operating system it doesn't matter how much redundancy is designed into the environment!
- Security can help limit who can change the underlying system
 - Deliberate changes by Subject Matter Experts = Good ☺
 - Accidental changes made by someone poking under the covers = Bad ☹

What's the Point of Security?

- Security on z/OS
- External Security Manager
 - CA ACF2
 - CA Top Secret
 - RACF



Redundancy vs Security

- Massive redundancy by design
- Dynamically alterable elements
- Hot swap capabilities

VS

- Changes to the underlying system are required to operate BAU
- Changes to the underlying system can cause availability problems
- Security can help limit who can change the underlying system

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Security vs Redundancy

- Changes to the underlying system are required to operate BAU
- Changes to the underlying system can cause availability problems
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VS

- Massive redundancy by design
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Who Wins?

- BAU is critical
- Compliance with regulations is critical
- Nobody really knows as Compliance regulations are only just “getting teeth”
- Watch this space

Questions

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