

Enterprise to Cloud: Operational Challenges

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IBM Connections Cloud is one of IBM's oldest SaaS solutions, getting its start in 2007 with the acquisition of a cloud-based eMeeting service.

The business has since been on a continuous journey of transformation, from traditional enterprise to cloud delivery.

From an operations discipline perspective, these are the four largest challenges faced by the organization:

1. Separation of duties
2. Monitoring and KPI measurement
3. Issues with long-lived systems
4. Enterprise architectures unfit for cloud

Separation of Duties

- Traditional interpretation based on a historically enterprise oriented delivery methodology
 - Developers not allowed to access production
 - Operations not allowed to change code
- Made incident management and customer support costly and slow
- Developers lacked ability to verify accuracy of deployments and configuration
- This interpretation falls apart in a modern DevOps delivery

Separation Duties - a modern interpretation

- Developers allowed to access production, just not allowed to alter its state or access any customer data
 - Give developers read-only access to service configuration and logs
 - Able to triage problems first hand
- “Operations as code” - operators are now contributing code to the stream as well
- In the DevOps world, Separation of Duties pertains more to the **strength of the delivery pipeline** and ensuring as complete functional and security testing as possible
 - Different groups responsible for different parts of the pipeline

Monitoring and KPI metrics

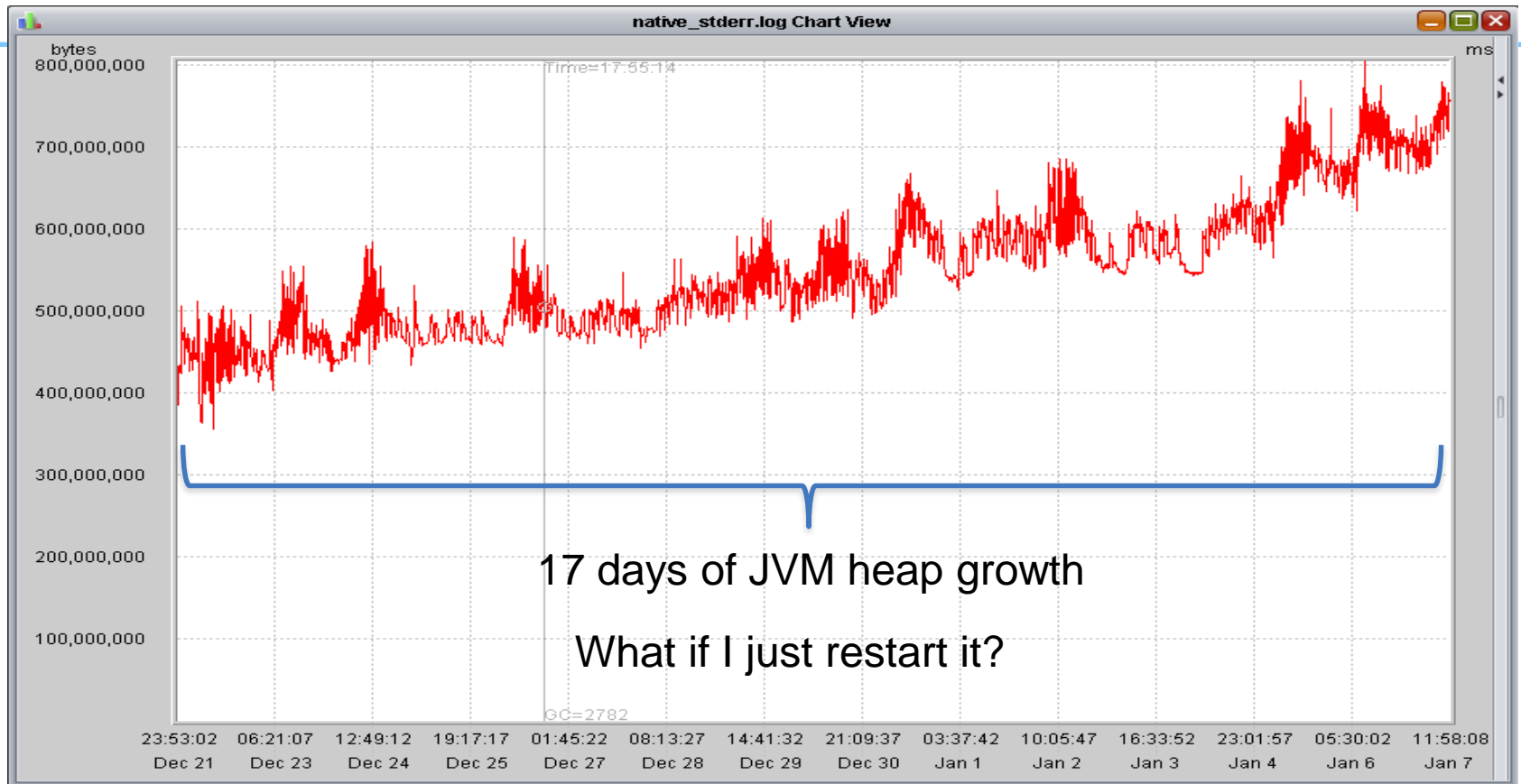
- Original monitoring infrastructure was a patchwork quilt of open source and in-house technologies deployed within the data center
- Coverage was incomplete and data only available to operators with a VPN into the management network
- Other stake holders (developers, support, management, planners, etc) had no visibility to data
 - Difficult to request and not real-time
- Made it impossible to understand how the system was behaving and make correct decisions on capacity needs and system improvements

Monitoring and KPIs available to all

- Normalized on a cloud-based market-leading monitoring solution
- Easy to deploy with literally overnight results and impact
 - “Eyes on” performance and data issues that no one knew were there
- Everyone given access who wanted it
 - Customized personal dashboards were prevalent
- Allowed for more productive and efficient capacity analysis and reaction to growth needs
- Freed the team to grow to more mature monitoring models
 - Data science and anomaly detection
 - End user instrumentation

Systems as pets

- In a traditional enterprise test data center, systems are “named”
 - Cartoon, literary and movie characters and astronomical entities were the most popular
 - Gandalf, Frodo, Daffy, Mickey, Jupiter, etc
- Systems were long lived, expected never to need to be rebooted, and were lovingly cared for like pets
 - Rarely rebuilt, if ever. Restarted only when absolutely necessary
- The platform was plagued by issues common with long lived systems:
 - Configuration drift
 - Memory leaks
 - Runaway processes/CPU
- Software was patched/updated instead of re-installed
 - Update timeframes were unpredictable and often required an outage to complete



Systems as cattle

- Shifted to a regular rebuild methodology
- Focused on software install and got it rock solid and fast
 - No more unpredictable updates
 - Totally automated (zero touch)
- Eliminated a whole class of problems related to install/config issues and configuration drift
 - 60% of all customer impacting issues at the time
- Used an A/B flip approach
 - Traffic on side A
 - Rebuild side B and test
 - Switch traffic to side B
 - Huge risk mitigation
 - Allowed team to focus on system deployment and verifying the results before the first user hit it
 - Outage window relegated to the time it took to swing traffic from A to B

Costly architectures

In the cloud, cost can best be measured in terms of how many humans¹ touch how many servers² how many times³.

The degree to which you can reduce any of those 3 aspects will determine how well you manage costs and grow a profit margin.

The propensity to build SaaS solutions from in-house enterprise software simply perpetuates the operational challenges related to heavy weight software, ballooning costs and eroding profits.

Operator to server ratios

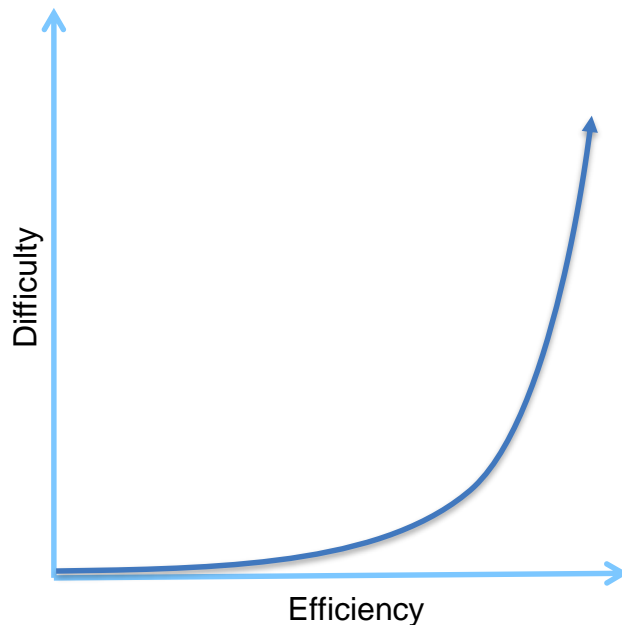
Major global cloud-based services: 1 to 20k+

Cloud platform and service providers: 1 to 2k+

Average Enterprise: 1 to 100s

Painful realization

- At some point, we had to realize that any more investment in automation and simplification would yield only incremental improvement in cost
 - We were up against restrictions imposed by chosen middleware and software architectures
 - We were not affording ourselves the investment necessary to change to a different platform all together
- To get it right, we had to start over, and in some cases we did



Thank You



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