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# THE HIERARCHY OF MONITORING NEEDS

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# What does it all mean?

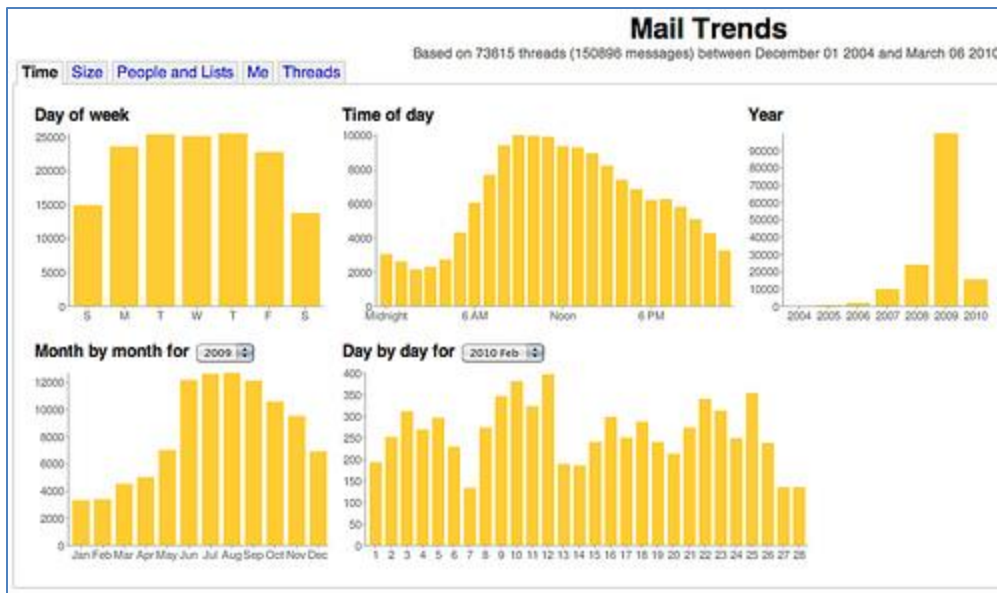
## **mon·i·tor**

transitive verb \ 'mä-nə-tər \

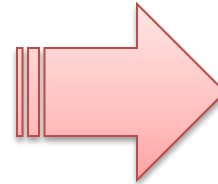
*to watch, keep track of, or check  
usually for a special purpose*

<http://www.merriam-webster.com/dictionary/monitor>

# Monitoring vs. Alerting



<http://www.flickr.com/photos/4braham/4412084879/>



<http://www.flickr.com/photos/justinharter/34306097/>

# Why do we monitor?

Protection

Awareness

Analysis

Resolution

# Thinking Strategically



# The Hierarchy



# Survival

## The Critical Health Check

- Do we have **reliable** backups?
- Can we **query** the instance?
- Are we running **out** of space?





# The Emergency Survival Pack

- Monitor msdb.dbo.backupset
  - Backup locations
  - Backup success
- Service uptime
  - Powershell
  - Linked Server queries
- Space
  - Xp\_fixeddrives
  - CLR code
  - Powershell



# Demo – Survival Kit

# Knowledge

## The business knows

- When can we be **down**? When can we be **up**?
- How fast is **fast**? What's too **slow**?
- Who do we turn to for **help**?



# Knowledge

- The business knows what's important:
  - Level of uptime (how close to 100%?)
  - Performance requirements
  - When do I need to get up?
- Establish your **Service Level Agreements(SLAs)**

# Three Kings

## Availability

- Hours of operation
- Uptime requirements
- Recovery Point Objective(RPO)
- Recovery Time Objective (RTO)
- Maintenance Windows

## Performance

- Query Response Time
- Index and Statistics Maintenance
- Blocking Process Resolution

## Support

- Response Hours and Times
- Ticket management
- Service tiers
- Issue prioritization
- Maintenance Windows

# Service Tiers



- Determine your support levels
- Set reasonable expectations
- Break it down
  - Business Critical (24X7X365)
  - Extended Support
  - Business Hours
- Define Response Times

# Direction

## Translating to Tech-speak

- What can be measured?
- How do we define what's important to us and the business?
- The business requirements become metrics to monitor.



# Where do we start?

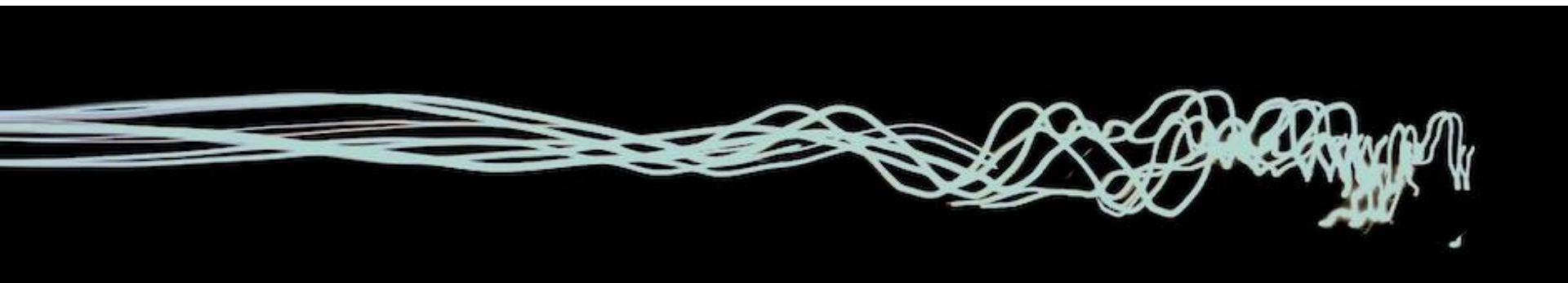


<http://www.flickr.com/photos/grapecity/4237886048/>



# A Starting Point

- Up to you, as the expert to determine what's important.
- Establish initial thresholds and windows
  - Page Life Expectancy
  - Logical Connections
  - Batch Requests
  - SQL Compilations/Re-Compilations
  - TempDB usage
  - Query Stats
  - Disk Throughput
  - Database and Table Size
  - CPU Utilization
  - Memory Usage
  - Backup/Maintenance Length
  - Failed Logins



# Actualization

## From What to How

- What's available to us?
- How specific do we need to be?
- Two paths are available.
  - Out of the Box
  - Off the Shelf



# Out of the Box

## **Tools included with SQL Server**

Dynamic Management Objects  
(DMOs/DMVs)

Wait Stats

SQL Agent

Performance Monitor (Perfmon)

SQL Server Audit

Powershell

Windows Management Instrumentation (WMI)

# Off The Shelf

## What's great!

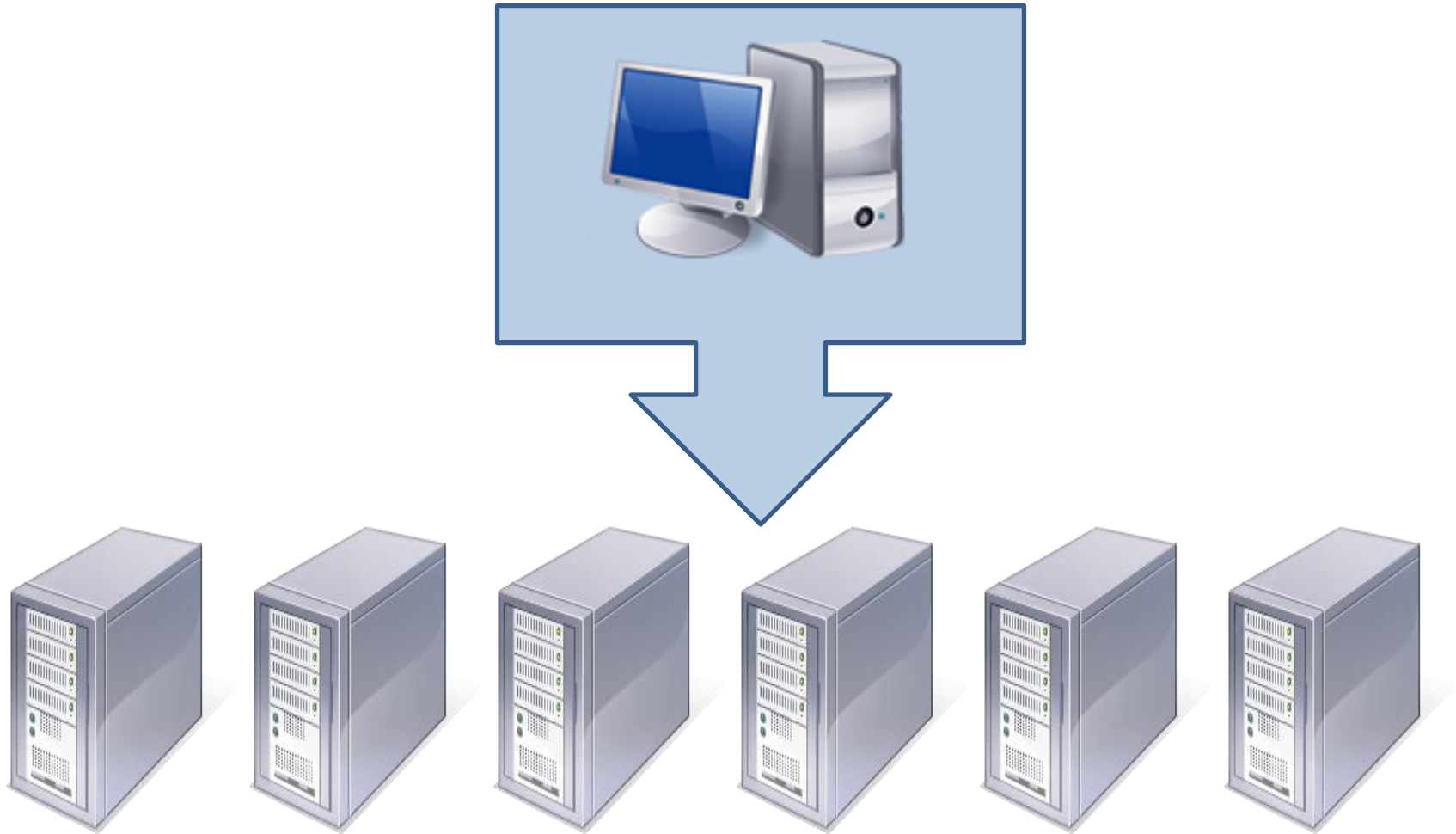
Vendors have done all the work!  
Most everything is covered!  
Pre-built reports and alerts!

## What's not so great...

Must be configured for your environment...  
Range from system wide to very specific...  
It's additional cost...

# Evaluate

# Watching From A Distance



# Understanding

## You Are Here

- How accurate are the metrics?
- How good are the thresholds?
- Now we see how healthy our databases are.





# Baselines



# Benchmarking

- Artificial stress
- Create load and measure your thresholds
  - HammerDB
  - DVDStore
  - SQLIO
  - IOMETER



# Demo - HammerDB

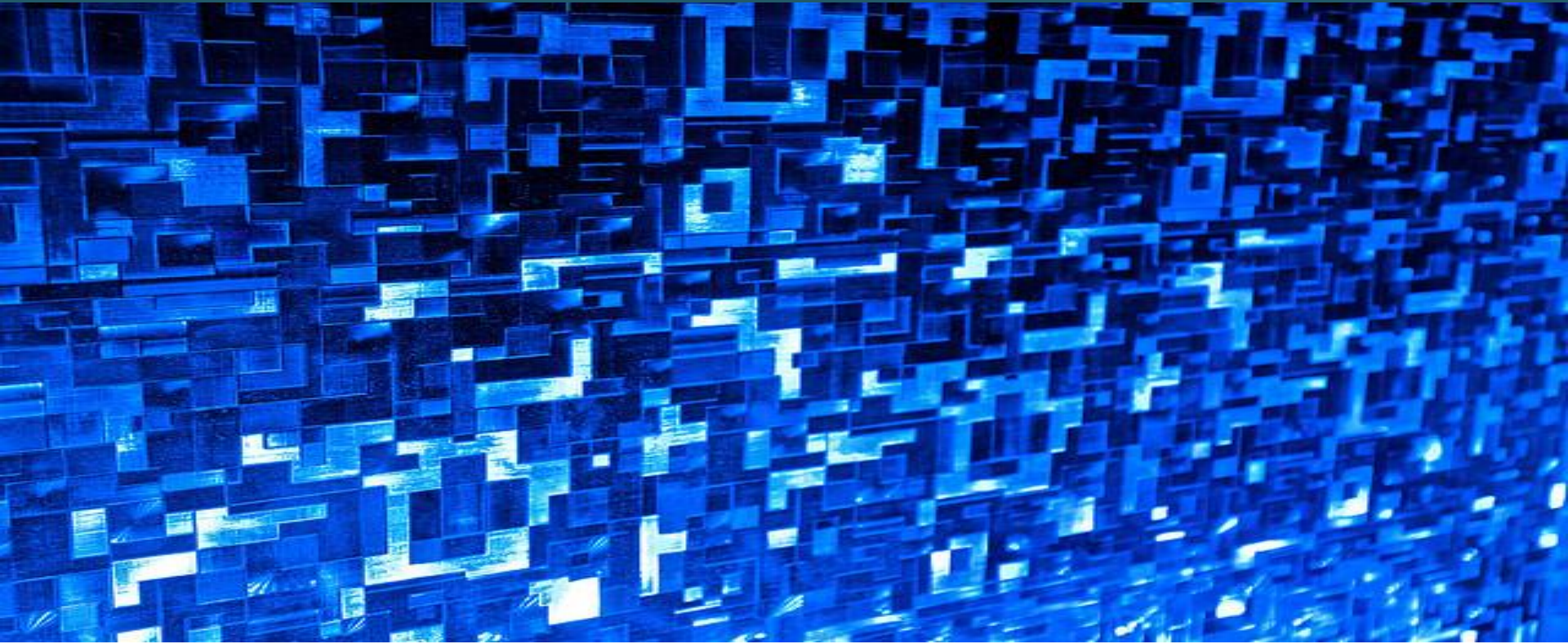
# Prediction

We're here, how do we get there?

- **Review** our current benchmarks
- **Analyze** the trends and patterns
- **Plan** based on the information



# Patterns



- More than just database statistics, system statistics
- Some metrics could tell you many things
- Correlate your events and statistics.

# Wrapping up



# Resources

- The Ten Commandments of SQL Server Monitoring – Adam Machanic  
(<https://www.simple-talk.com/sql/database-administration/the-ten-commandments-of-sql-server-monitoring/>)
- Glenn Berry's DMV script
- Disk Space CLR – Tara Kizer  
(<http://weblogs.sqlteam.com/tarad/archive/2007/12/18/60435.aspx>)
- Hammer DB  
(<http://hammerora.sourceforge.net/>)

# Questions

**HUH?**

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