Disaster Prevention
Optimizations, Insights, and Best Practices

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Weatherford®

AGENDA

1. Introduction
2. Goals
3. Proactively Identifying Impending Issues
4. Recommendations and Optimizations
5. Preventing Data Loss and Downtime

Disaster Prevention

How to prepare for a visit from Mayhem

Disaster Prevention

How to prepare for a visit from Mayhem

Mayhem is everywhere

Problems vs Disasters

Problems

- May occur on a regular basis and are often outside our control
  - Hardware failure
  - Accidental deletion of files
  - Communication device failures

Disasters

- Occur when we're not prepared to handle a problem
  - System downtime
  - Data loss
  - UIS instability

Disaster Prevention

- Goals
  - Awareness
  - Not a deep dive
- Other resources
  - White paper
  - Call CygNet Support
  - 2017 Support project

Proactively Identifying Impending Problems – Before they Turn into Critical Issues

Catching Mayhem at the door

The Presenting Problem

- Presenting Problem
  - The initial symptom which signals that an issue exists
    - Not the root issue
    - Detectable and Correctable

How do you proactively identify the root issue?

CygNet Service Monitor (SVCMON)

- What is SVCMON?
  - CygNet Current Value Service (CVS)
  - Gathers statistics
    - Host
    - Site
    - Service

CygNet Service Monitor (SVCMON)

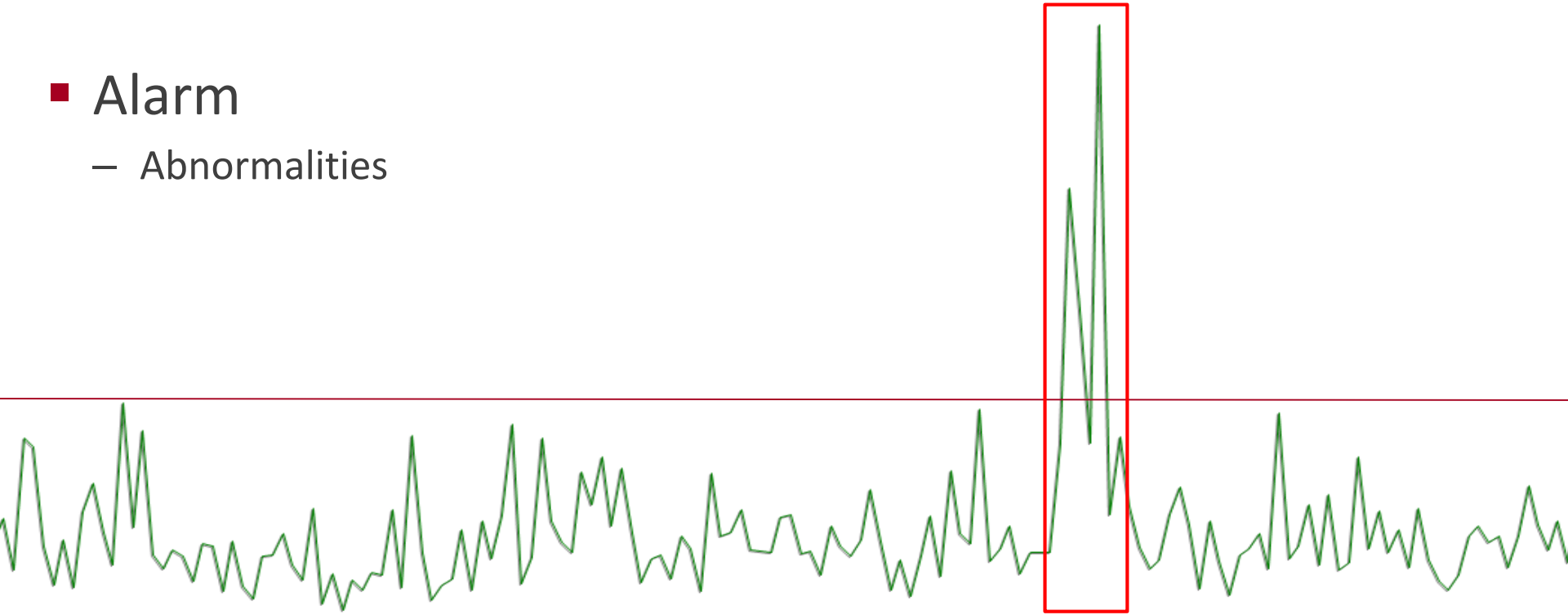
- Monitor real-time statistics
  - Define acceptable ranges
  - Set up alarms and notifications
- Trend system performance
  - Analysis
  - Performance degradation
  - Troubleshooting

Service Monitor Guidelines

- Items to monitor?
  - All of them
- Data retention?
  - At least a year

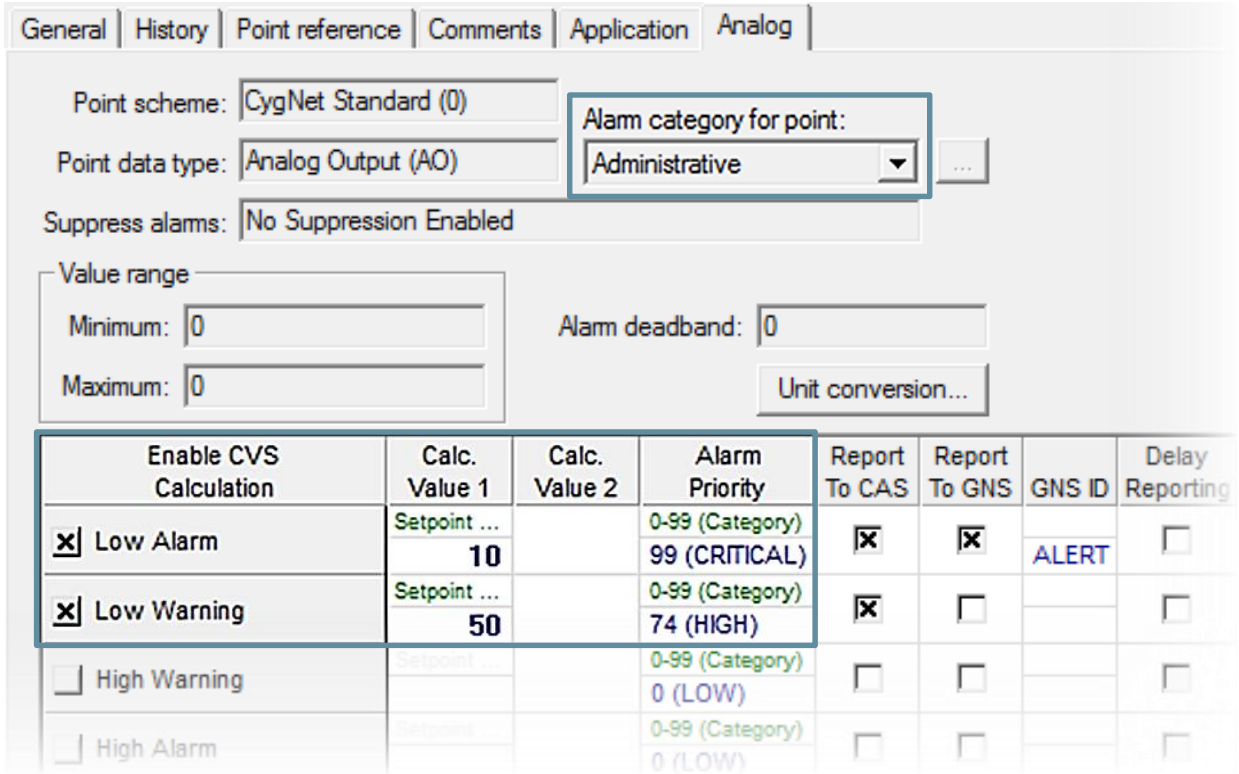
Service Monitor Guidelines

- Alarm
  - Abnormalities



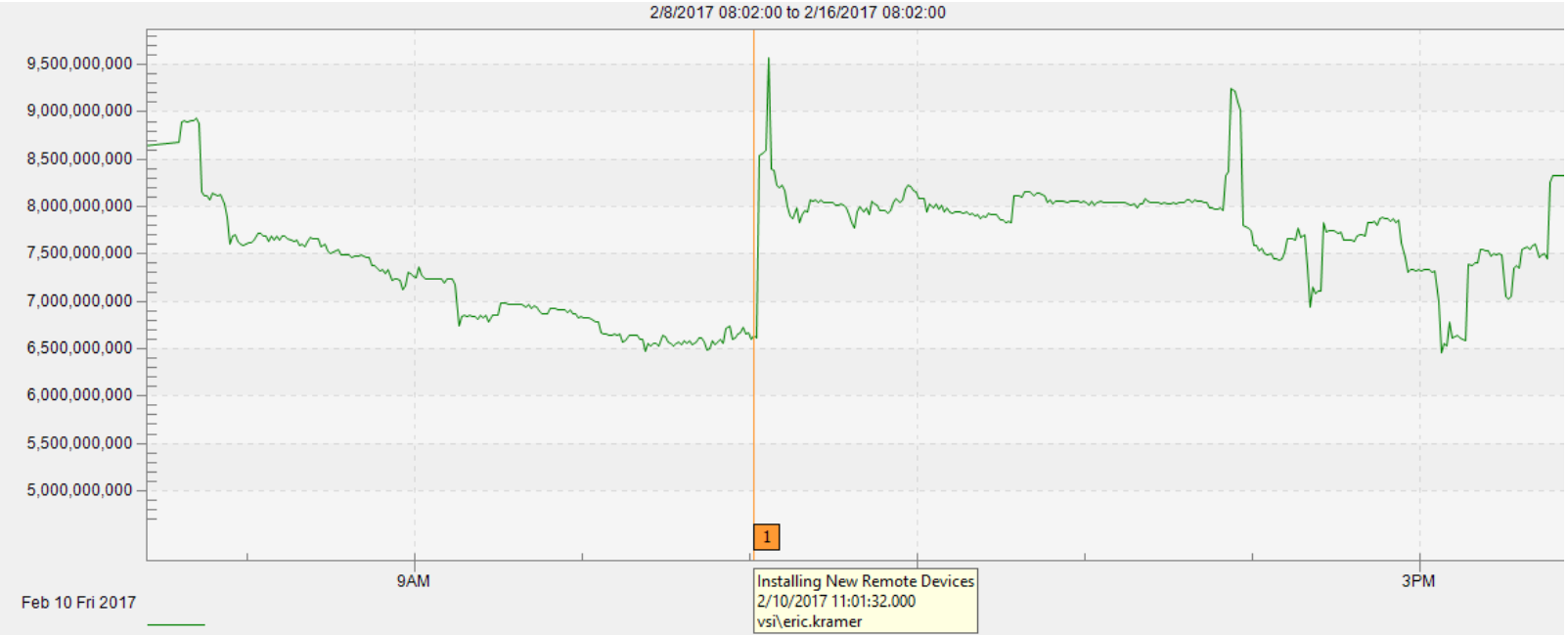
Service Monitor Guidelines

- Alarm
  - Abnormalities
  - Limits and thresholds
  - Priorities
  - Categorization
- Notifications
  - Critical alarms



Service Monitor Guidelines

- NOTE Service



Service Monitor Guidelines

- Considerations
  - Dedicated SVCMON services
    - VHS
    - CAS
  - Dedicated SVCMON site

Working with Logs

Event Logging Service (ELS)

- All services
- Overview
- Review daily
- Log writes to ELS (SVMLOGSWRT)

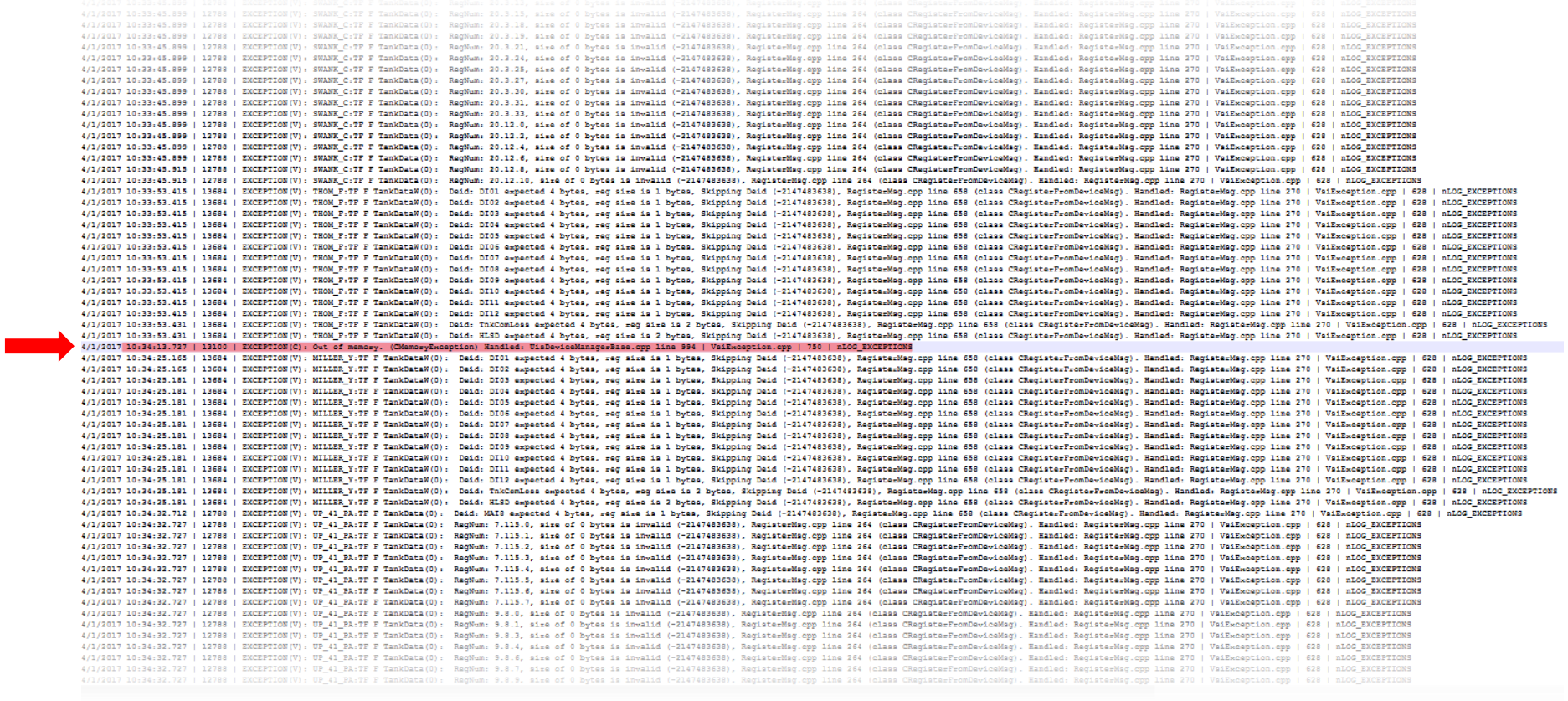
Service Log Files

- Service specific
- Detailed view
- Review as needed
- Log writes to file (SVMLOGFWRT)

Working with Logs

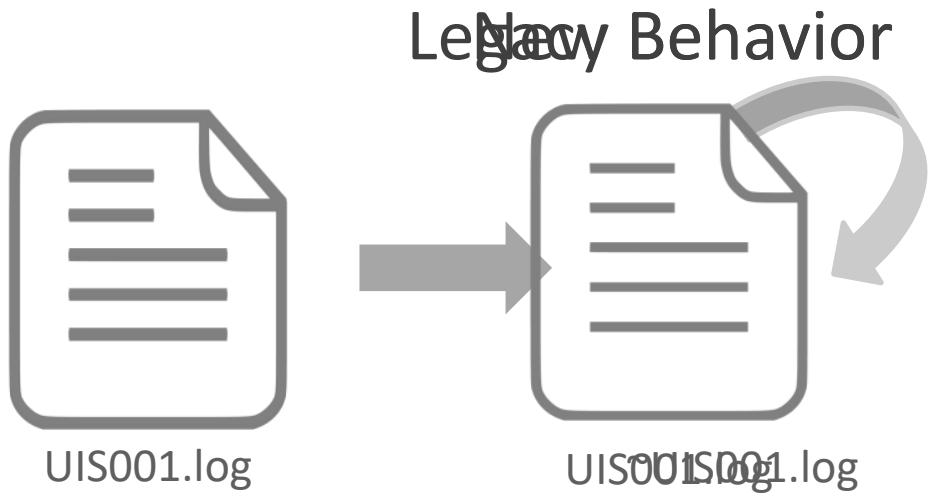
- Clean up
  - Quickly spot abnormal behavior
  - Easily identify relevant content

Working with Logs



Working with Logs

- New in 8.5.0
  - Extended logging



Working with Logs

- New in 8.5.0
  - Extended logging
  - Opt-in

```
#----------------------Logging Keywords-----------------------
#
LOGMASK_ELS                         CONTROL  EXCEPTIONS
LOGMASK_FILE                        CONTROL  EXCEPTIONS  WARNING
#
LOGFILE_FILE_COUNT                  2
LOGFILE_FILE_SIZE                   100
LOGFILE_LINE_COUNT                  100000
LOGFILE_LIMIT_MODE                  LINE
LOGFILE_MODE                        EXTENDED
```

Recommendations and Optimizations

Preparing for Mayhem

Recommendations & Optimizations

Why Optimization?

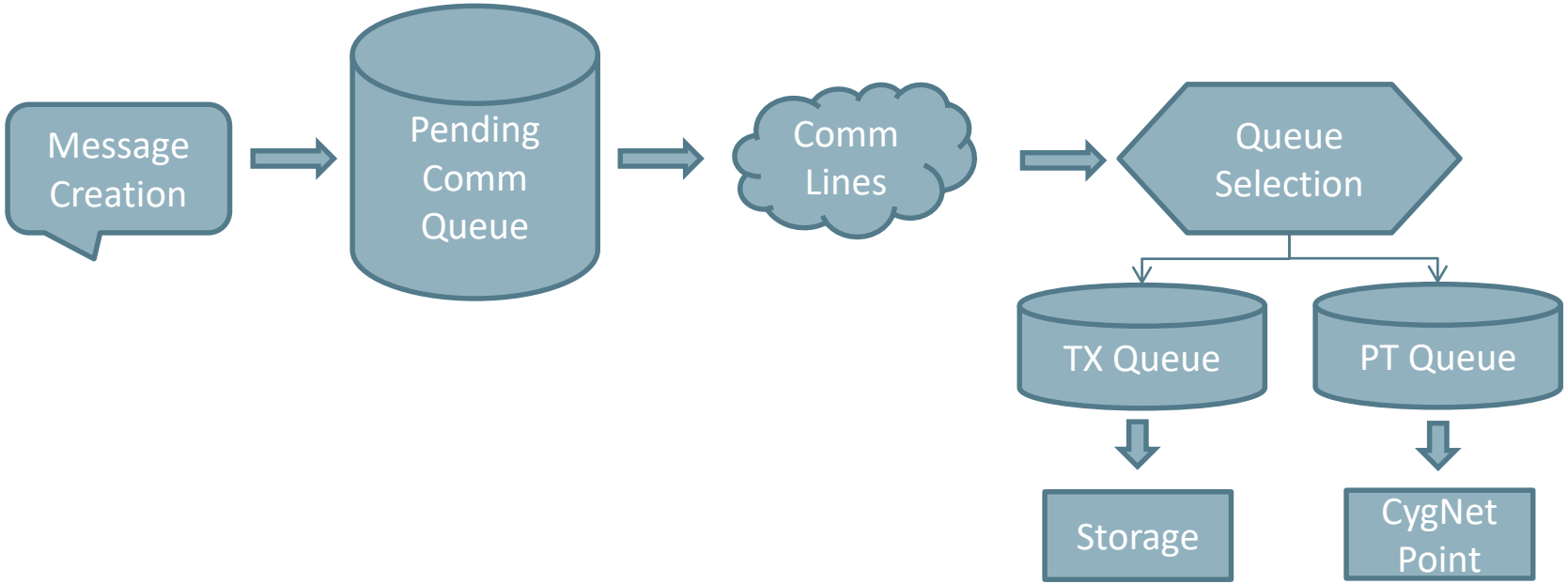
Recommendations & Optimizations

- Resource bottlenecks
  - Memory
  - CPU
  - Drive I/O
- Demand > availability
  - Decrease demand
  - Increase availability

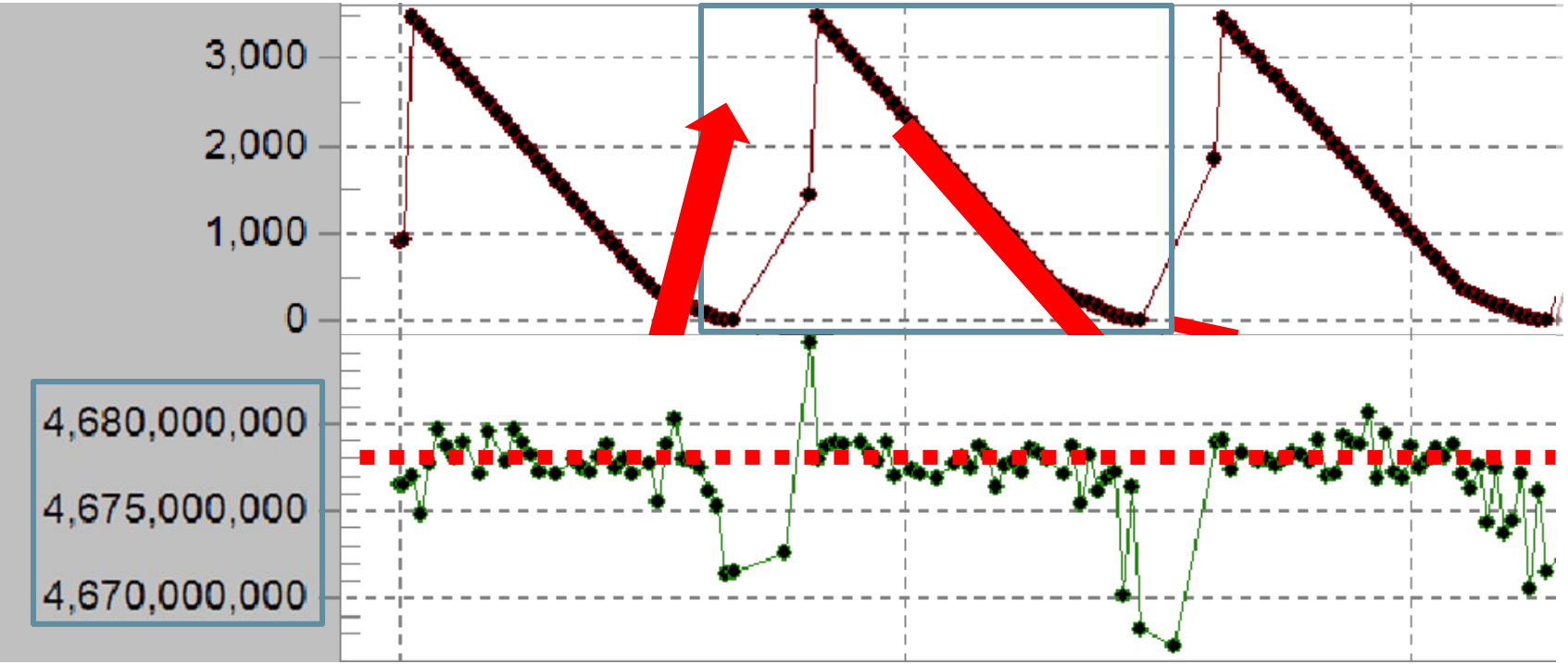
UIS/DDS Optimizations

UIS/DDS Optimizations

- The journey of a UIS message



UIS/DDS Optimizations



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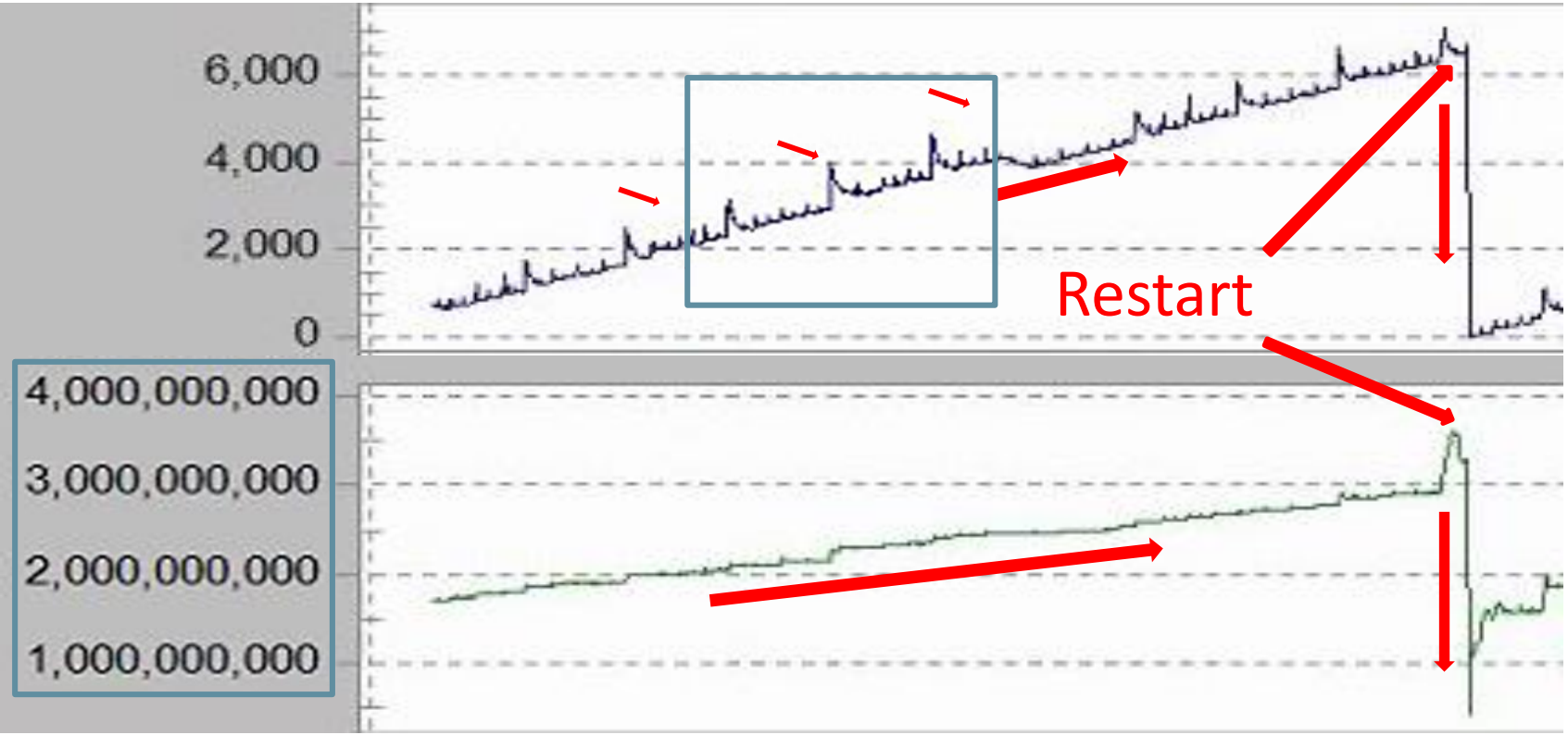


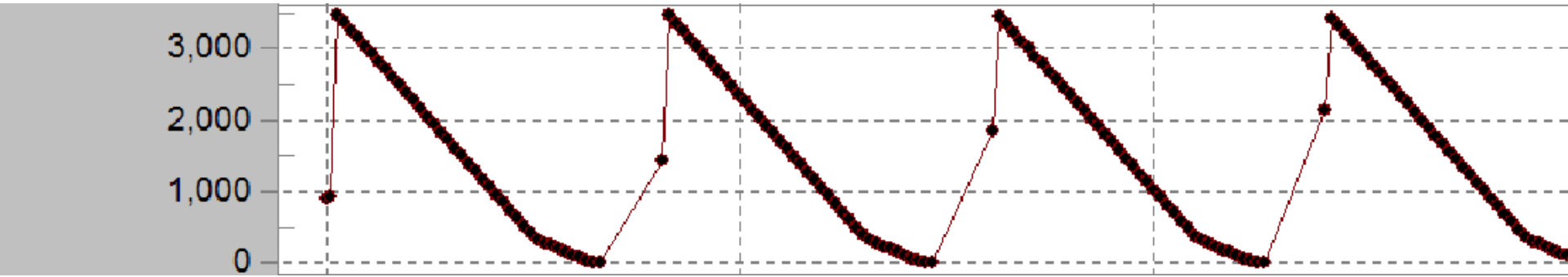
UIS/DDS Optimizations

- Bottleneck #1 – Memory
  - 32-bit process – 4GB memory limit
  - 64-bit process – 16.8 million terabyte memory limit

UIS/DDS Optimizations

- Preventing death by pending comm queue
  - Alarm
    - Virtual memory (SVMVIRT)
    - Pending comm queue (SVMUISPNDC)
    - Failed communications (SYCSSTAT)
  - Optimize
  - Throttle

UIS/DDS Optimizations



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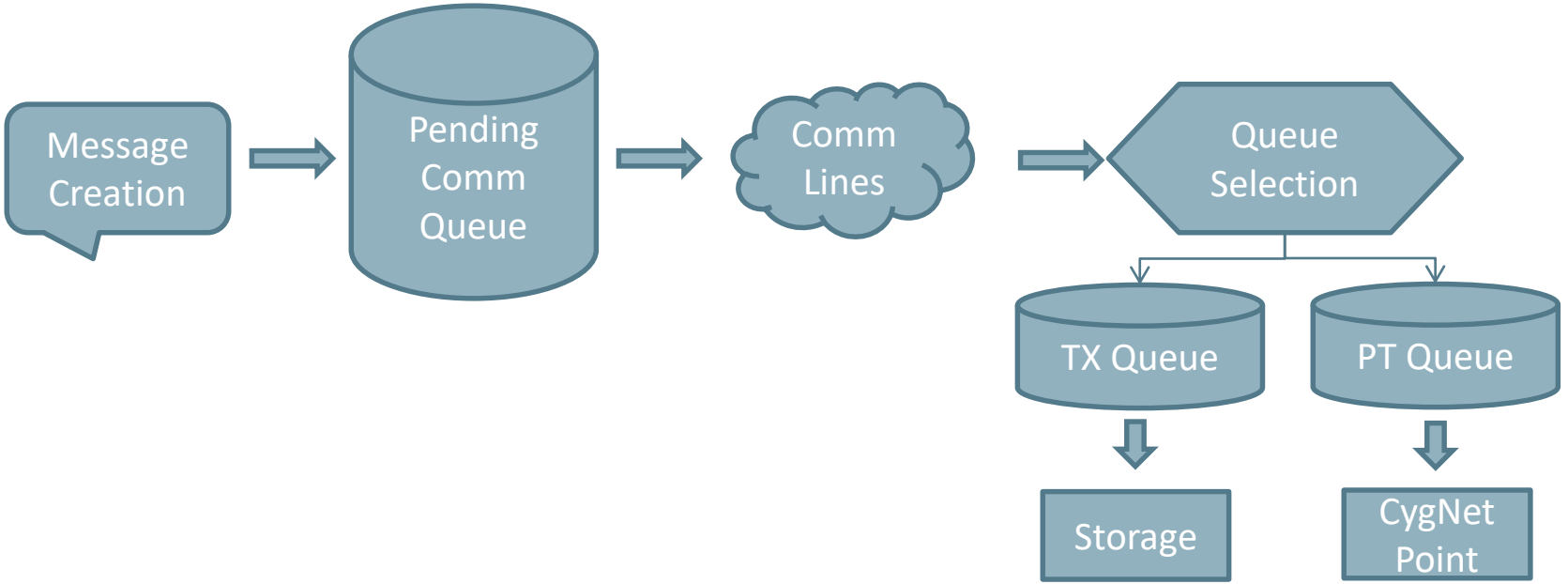
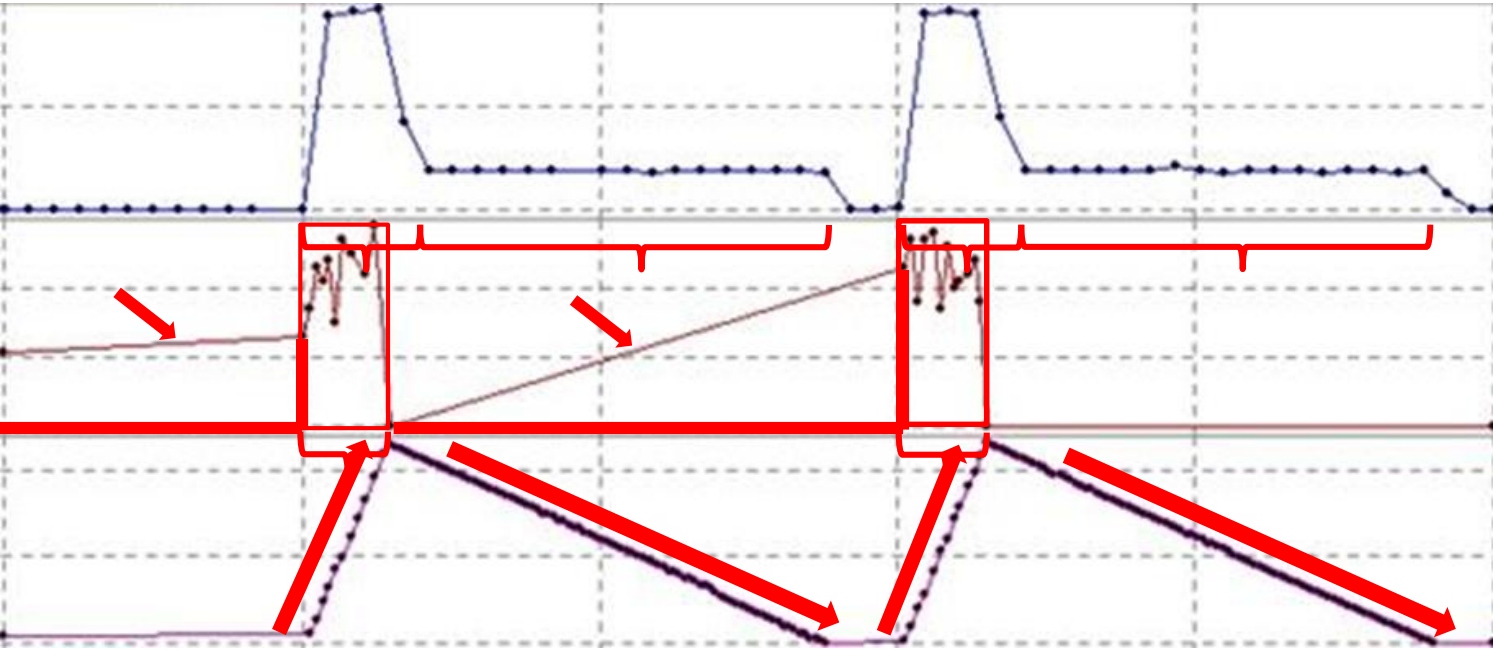


UIS/DDS Optimizations

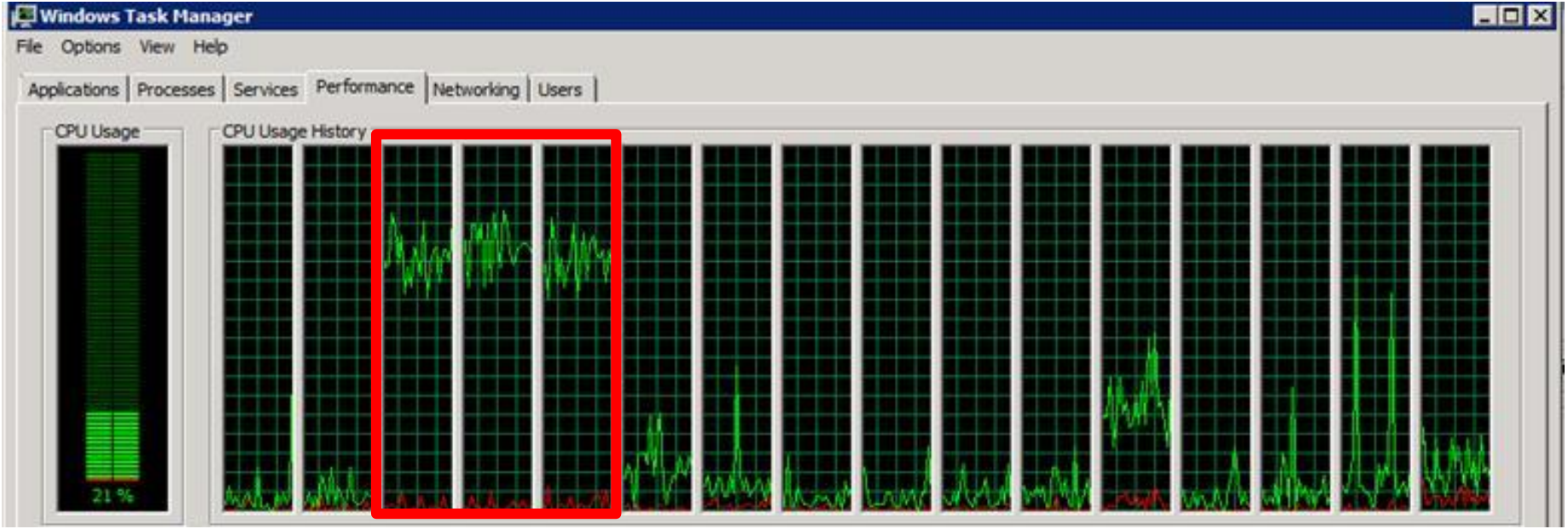


CPU Usage

Pending Comm Queue

Response Processing Queue

UIS/DDS Optimizations



UIS/DDS Optimizations

- Bottleneck #2 – CPU
  - Default: 3 threads per response queue
  - Configurable up to 16 threads

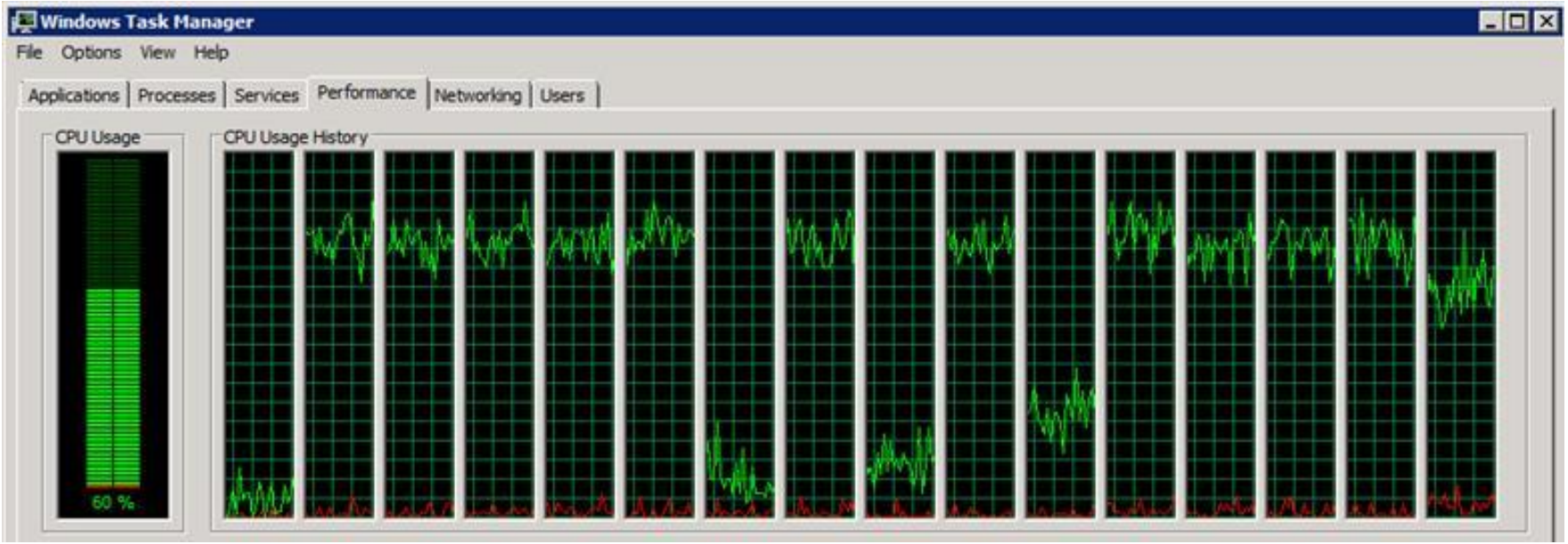
UIS/DDS Optimizations

- Increase thread count
  - Add incrementally

UIS/DDS Optimizations

- Increase thread count

12 Threads Configured



UIS/DDS Optimizations

CPU: 3 Threads

Pending Comm Queue

Response Processing Queue

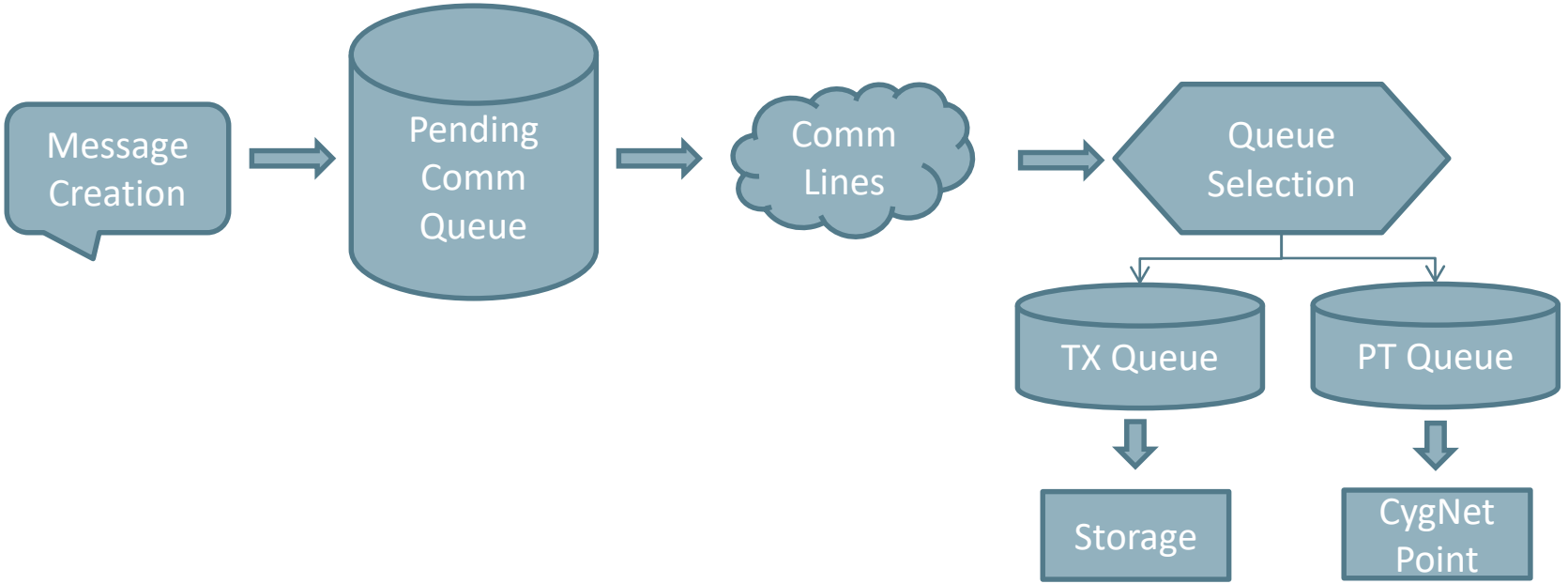
UIS/DDS Optimizations

CPU: 12 Threads

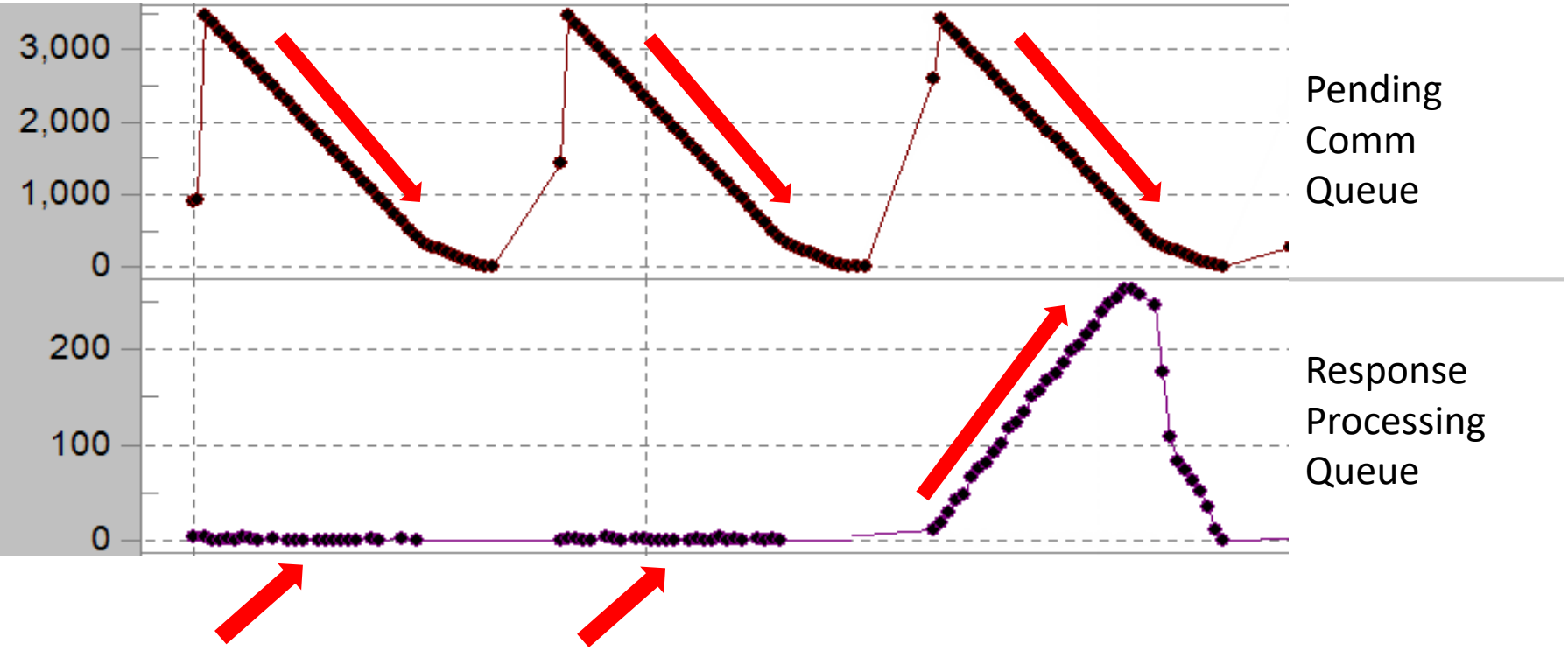
Pending Comm Queue

Response Processing Queue

UIS/DDS Optimizations

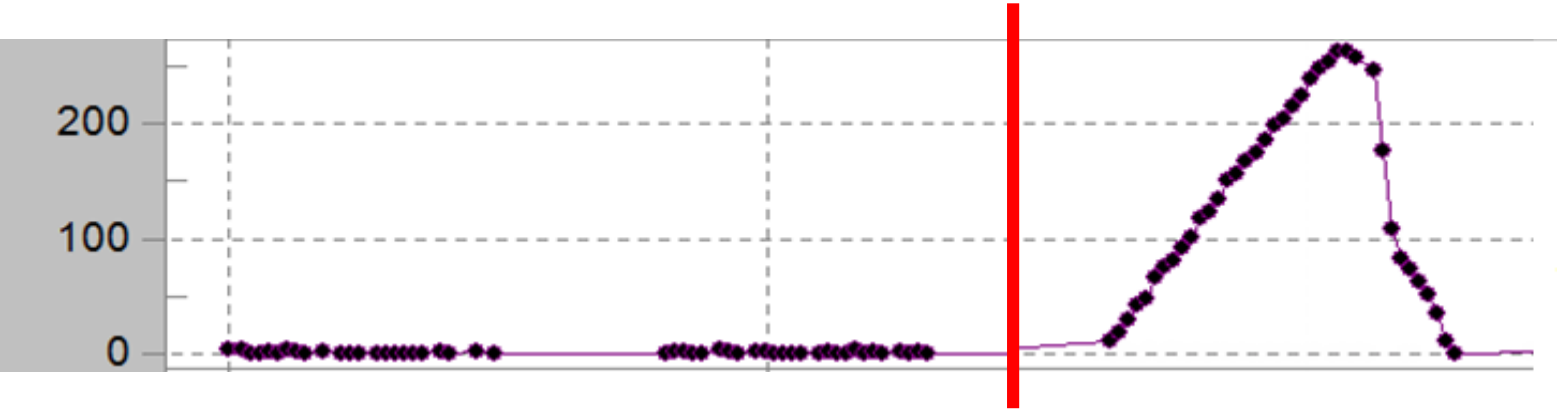


UIS/DDS Optimizations



UIS/DDS Optimizations

- Bottleneck #3 – Disk I/O



Response Processing Queue

UIS/DDS Optimizations

- Bottleneck #3 – Disk I/O
  - Disk queue length (SVMADQLC) < 1
- Solutions
  - Reduce read/writes
  - Increase cache
  - Upgrade drive

Protect Your Enterprise from Data Loss and Downtime

Cleaning up after Mayhem

Recovery Options

- Backup
- Replication

Recovery Options

- Backup pros
  - Protects against file corruption and accidental deletion
  - Automatic Service Recovery (ASR)
  - Simple to implement

Recovery Options

- Backup cons
  - Longer downtime
  - May lose recent changes
  - Does not address hardware failure

Recovery Options

- Replication pros
  - Changes protected in real-time
  - Significantly reduced downtime
  - Protection against hardware failure

Recovery Options

- Replication cons
  - Does not protect against file corruption or accidental deletion
  - Requires separate hardware
  - Implementation is typically more complicated

Recommended Practices

- Backups
  - Maintain multiple versions
  - Keep off production system
  - Verify backup success

Recommended Practices

- Replication
  - Test failover

What about Redundancy?

Redundancy

- Utilizes replication
  - Same pros and cons
  - 8.5.0 – On-demand failover
  - 8.5.1 – Automatic failover

Summary

Summary

- Catching Mayhem at the door
  - SVCMON
  - Logging

Summary

- Preparing for Mayhem
  - Optimizing the System
  - Identifying bottlenecks

Summary

- Cleaning up after Mayhem
  - Backup + Replication = Recovery Plan

Disaster Prevention

How to prepare for a visit from Mayhem

Additional Resources

- CygNet Blog
- CygNet Support
- 2017 Support Projects

Questions?