



i-Chi and the art of system management

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What is i-Chi?

- Thinking differently about IBM i System Management
- Embracing new ways of doing old tasks
- Automating processes and monitoring
- Using the latest features in ACS, Nav4i, ARE, AJS & SQL Services
- Integrating IBM i SysAdmin with other platforms
- Reducing your reliance on the 5250 command line

But not your reliance on commands and programs

What is he talking about?

[Part 1:](#) Audit Journal

[Part 2:](#) Improved User Management

[Part 3:](#) Add Run SQL Script to your Toolbox

[Part 4:](#) Establishing a Baseline S

[Part 5:](#) Add SQL Performance Center to your Toolbox

[Part 6:](#) How Much Downtime do I need for my backups?



Part 1

Audit Journal

Why bother improving handling Audit journal data?

- Make better decisions
- Implement automation to improve consistency
- Delegate subsets of Audit journal data to development
- Facilitate the transition from Security level 30 to 40
- Improve security of your systems
- Allow most of the above to happen automated

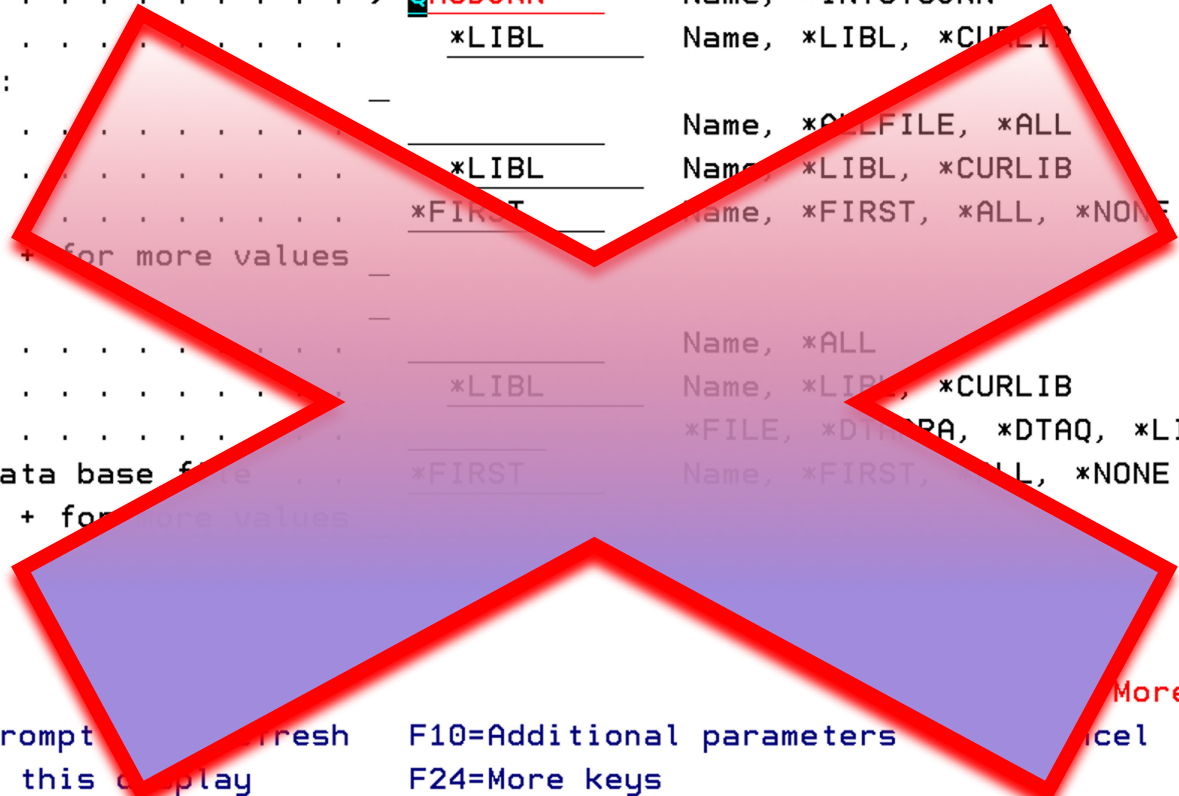
DSPJRN is not your friend

Display Journal (DSPJRN)

Type choices, press Enter.

```
Journal . . . . . > QAUDJRN      Name, *INTSYSJRN
Library . . . . . *LIBL          Name, *LIBL, *CURLIB
Journaled file:
File . . . . .                Name, *ALLFILE, *ALL
Library . . . . . *LIBL          Name, *LIBL, *CURLIB
Member . . . . . *FIRST          Name, *FIRST, *ALL, *NONE
+ for more values
Objects:
Object . . . . .                Name, *ALL
Library . . . . . *LIBL          Name, *LIBL, *CURLIB
Object type . . . . .           *FILE, *DTA, *DTAQA, *DTAQ, *LIB
Member, if data base file . . . *FIRST      Name, *FIRST, *ALL, *NONE
+ for more values

F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display  F24=More keys
```



Navigator for i (Nav4i) is your new best friend

Actions including a schedule option

Filter any column

SQL button
To extract the SQL statement behind the data shown

Schedule

Data Mart Library

AUDDM_AF

Journal Entry Type

Authority Failure (AF)

Action

Append new data to the existing data mart

Audit Journal Starting Timestamp

Use the last timestamp in the data mart table

Audit Journal Ending Timestamp

11/14/2025 01:28 PM

Data Mart Filter

OK

Cancel

Manage Audit Journal Data Mart

Actions

☆

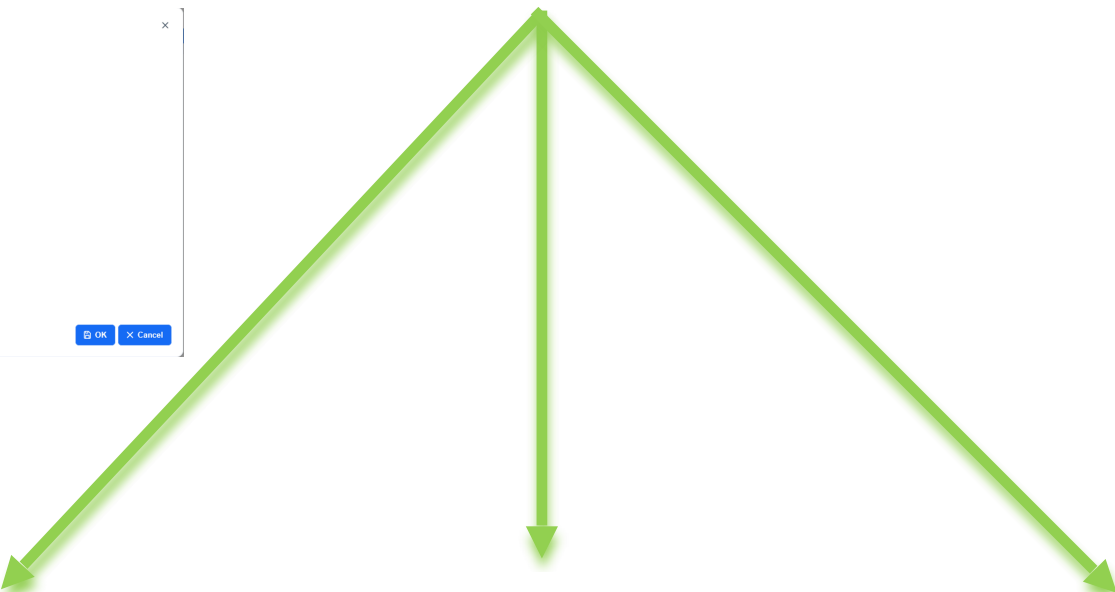
sql

↺

↻

⚙

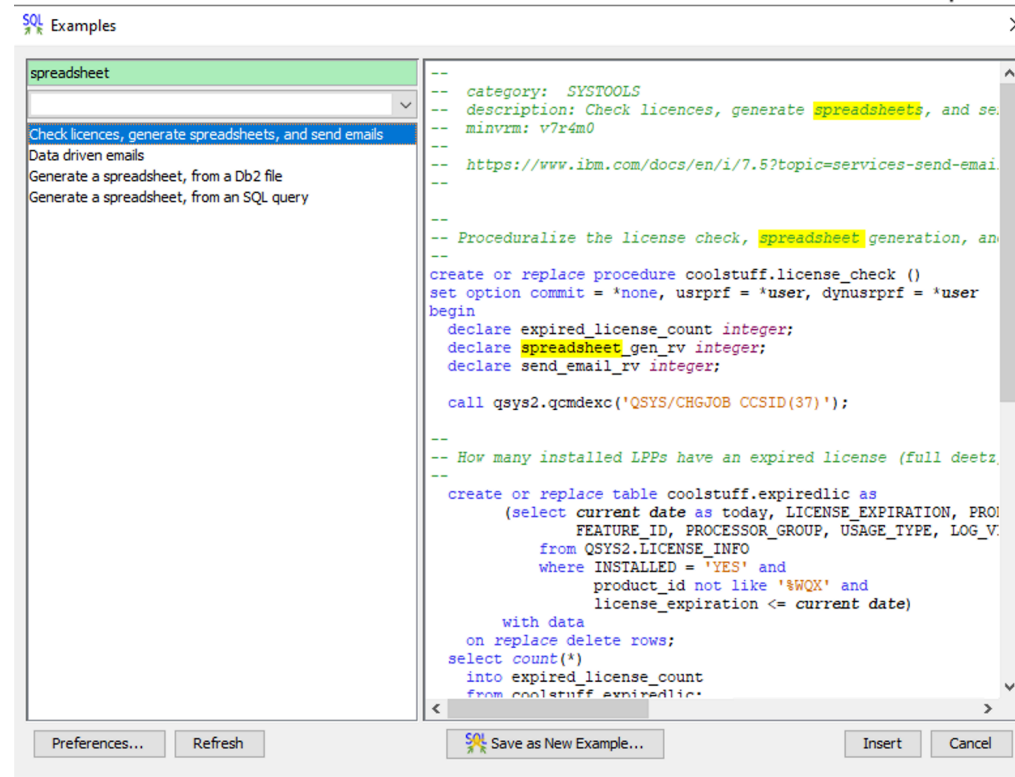
Data Mart Library ↑↓	Data Mart ↑↓	Data Mart System Table Name ↑↓	Data Mart Filter ↑↓	Journal Entry Type ↑↓	Status ↑↓
<div>Filter</div>	<div>Filter</div>	<div>Filter</div>	<div>Filter</div>	<div>Filter</div>	<div>Filter</div>
AUDDM_AF	AUDIT_JOURNAL_AF	AJ_AF		Authority Failure (AF)	COMPLETED



Automate the reviewing process

-- Create a SQL statement according to your needs
-- Limit the number of records just in case

```
SELECT ENTRY_TIMESTAMP, USER_NAME, QUALIFIED_JOB_NAME, VIOLATION_TYPE_DETAIL, OBJECT_LIBRARY, OBJECT_NAME, OBJECT_TYPE, PATH_NAME  
FROM AUDDM_AF.AUDIT_JOURNAL_AF WHERE ENTRY_TIMESTAMP > CURRENT_TIMESTAMP - 1 DAY LIMIT 100
```



Combine this SQL statement with the Insert from Examples "Check licences, generate spreadsheets, and send emails" example found and schedule this SQL script to run every day.

Part 2

Improved User Management

Why bother improving user management?

- Make better decisions
- Implement automation to improve consistency
- Delegate subsets of user management to other departments
- Improve compliance with regulations and certifications
- Improve security of your systems
- Allow most of the above to happen whilst you sleep

WRKACTJOB is not your friend

Work with User Profiles

Type options, press Enter.

1=Create 2=Change 3=Copy 4=Delete 5=Display
12=Work with objects by owner

Opt	User Profile	Text
—	ANDYY	Andy Youens
—	BRAD	Steve Bradshaw
—	CHARLIE	Charlie Katzen
—	DARREN	Darren Brown
—	EDDIE	Eddie the eagle Edwards
—	FRED	Fred Bloggs
—	HARRY	Harry T Hall
—	ITADMIN	IT Admin
—	JOE	Joe Bloggs

Parameters for options 2, 3, 4 and 5 or 12

====>

F3=Exit	F5=Repeat	F12=Cancel	F16=Repeat position to
F21=Select assistance level			F24=More keys

Navigator for i (Nav4i) is your new best friend

Filter any column

Sort any column

See details not available on 5250

More space for more details

Select & Sequence the columns you want

Users

Actions

Name ↑↓	Profile Status ↑↓	NetServer Disabled ↑↓	Special Authorities ↑↓	Password Change Date ↑↓	Sign-On Attempts Not Valid ↑↓	Description ↑↓
<input type="text" value="Filter"/> ⌵	<input type="text" value="Filter"/> ⌵	<input type="text" value="Filter"/> ⌵	<input type="text" value="Filter"/> ⌵		<input type="text" value="Filter"/> ⌵	<input type="text" value="Filter"/> ⌵
ANDYY	*ENABLED	YES	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2022-09-28 14:25:03.000000	4	Andy Youens
BRAD	*ENABLED	NO	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2023-06-09 17:59:46.000000	0	Steve Bradshaw
CHARLIE	*DISABLED	NO	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2023-06-09 18:00:58.000000	0	Charlie Katzen
DARREN	*DISABLED	NO	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2023-06-09 18:35:47.000000	0	Darren Brown
EDDIE	*DISABLED	NO	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2023-06-09 18:36:20.000000	0	Eddie the eagle Edwards
FRED	*DISABLED	NO	*ALLOBJ *SECADM *JOBCTL *SPLCTL *SAVSYS *SERVICE *AUDIT *IOSYSCFG	2023-06-09 18:36:44.000000	0	Fred Bloggs

Check for potentially inactive/obsolete users

```
Select Authorization_Name, Text_Description, Previous_Signon, Creation_Timestamp, Status, Pass
From Qsys2.User_Info
Where Previous_Signon < (Current_Date - 60 Days)
      And Authorization_Name Not Like 'Q%'
Order By Previous_Signon Desc;
```

Authorization Name	Text Description	Previous Signon	Creation Timestamp	Status
TEZ	<NULL>	2023-01-30 19:04:41.000000	2023-01-30 15:53:30.000000	*ENABLED
ANDYY	Andy Youens	2022-10-03 18:29:54.000000	2022-09-28 14:25:03.000000	*ENABLED

You can embed SQL like this in a program, add your business logic, automating alerting to IT and HR Departments and disabling users.

Part 3

Add Run SQL Script to your Toolbox

Why use Run SQL Scripts?

- ✓ Flexibility
- ✓ Facilitate reuse
- ✓ Consistency
- ✓ Embrace IBM i services (SQL)

Once you get started writing SQL there is no way back 😊

Some Examples

```
-- Save Library QUSRBRM after resolving all issues
CL:CRTSAVF FILE(QGPL/BR1) TEXT('QUSRBRM prior to upgrade from 5770BR1 to 5770BR2');
CL:SAVLIB LIB(QUSRBRM) DEV(*SAVF) SAVF(QGPL/BR1);
-- Remove the BRMS SQL services to prevent file dependency issues
CL:CALL QBRM/Q1AOLD PARM('INSTALL ' 'RMVSQLSERV' 'N' '00');
stop;
-- Check for locks to enable Delete of product 5770-BR1
-- end the jobs having locks
SELECT LOCK_STATE, LOCK_STATUS, LOCK_SCOPE, JOB_NAME
FROM QSYS2.OBJECT_LOCK_INFO
WHERE OBJECT_SCHEMA = 'QSYS' AND OBJECT_NAME = 'QBRM' AND OBJECT_TYPE = '*LIB';
stop;
-- Delete product 5770-BR1
CL:DLTLICPGM LICPGM(5770BR1) OPTION(*ALL);
stop;
-- Install product 5770-BR2
-- Include automatic accepting license agreement for 5770-BR2 7.5
CL:CALL PGM(QSYS/QLPACAGR) PARM('5770BR2' 'V7R5M0' '0000' 0);
CL:RSTLICPGM LICPGM(5770BR2) DEV(OPTVRT01);
stop;
-- Before continuing check if the job BRMSPRDINZ has completed
SELECT X.MESSAGE_TIMESTAMP, X.MESSAGE_ID, X.MESSAGE_TEXT, FROM_JOB
FROM TABLE (
    QSYS2.HISTORY_LOG_INFO(CURRENT_TIMESTAMP - 1 HOUR)
) X
```

```
-- category: System Management
-- description: Configure TLS for HTTP BRMS for i
CL:CHGWEBBRM HTTP(*AUTO 2088) HTTPS(*ON 2089);

CL:ENDTCPSVR SERVER(*HTTP) HTTPSVR(QBRMWEBSVR);
CL:DLYJOB 15;
CL:STRTCPSVR SERVER(*HTTP) HTTPSVR(QBRMWEBSVR);
CL:DLYJOB 15;
-- Check if port 2088 & 2089 are active
SELECT JOB_NAME,
LOCAL_PORT,
LOCAL_ADDRESS,
REMOTE_PORT,
REMOTE_ADDRESS
FROM QSYS2.NETSTAT_JOB_INFO
WHERE LOCAL_PORT IN (2088, 2089);
stop;
-- happy with testing?
-- Disable non-TLS port
CL:CHGWEBBRM HTTP(*OFF) HTTPS(*ON 2089) AUTOSTART(*YES);
stop;
CL:ENDTCPSVR SERVER(*HTTP) HTTPSVR(QBRMWEBSVR);
CL:DLYJOB 15;
CL:STRTCPSVR SERVER(*HTTP) HTTPSVR(QBRMWEBSVR);
|
```

Please do not forget when Prompting CL commands to Press F1

Part 4

Establishing a Baseline

What does normal look like?

- ✓ How busy are our processors?
- ✓ How busy is our storage?
- ✓ How much network traffic we generate?
- ✓ What does our memory usage look like?

When you know what normal looks like,
you can QUICKLY understand WHAT SORT of problem you have

Graph History – Part of Navigator for i

The screenshot displays the IBM Navigator for i web interface. On the left is a vertical navigation menu with icons and labels for various system components: Dashboard, Home, Work Management, Configuration and Service, System, Monitors, My Work, Network, Security, Users and Groups, Performance, File System, Bookmarks, and Serviceability. The main content area on the right shows a large padlock icon, the IP address 172.168.2.32, the status 'Active', and a small 'sql' icon. Below this, a 'Performance' panel is open, containing a list of options: 'Investigate Data', '> Manage Collections', 'Collection Services Configuration', 'Graph History - Summary' (which is highlighted in blue), and 'Graph History - Details'. A callout box points to the 'Graph History - Summary' option with the text 'View graph history summary'.

IBM Navigator for i

- Dashboard
- Home
- Work Management
- Configuration and Service
- System
- Monitors
- My Work
- Network
- Security
- Users and Groups
- Performance
- File System
- Bookmarks
- Serviceability

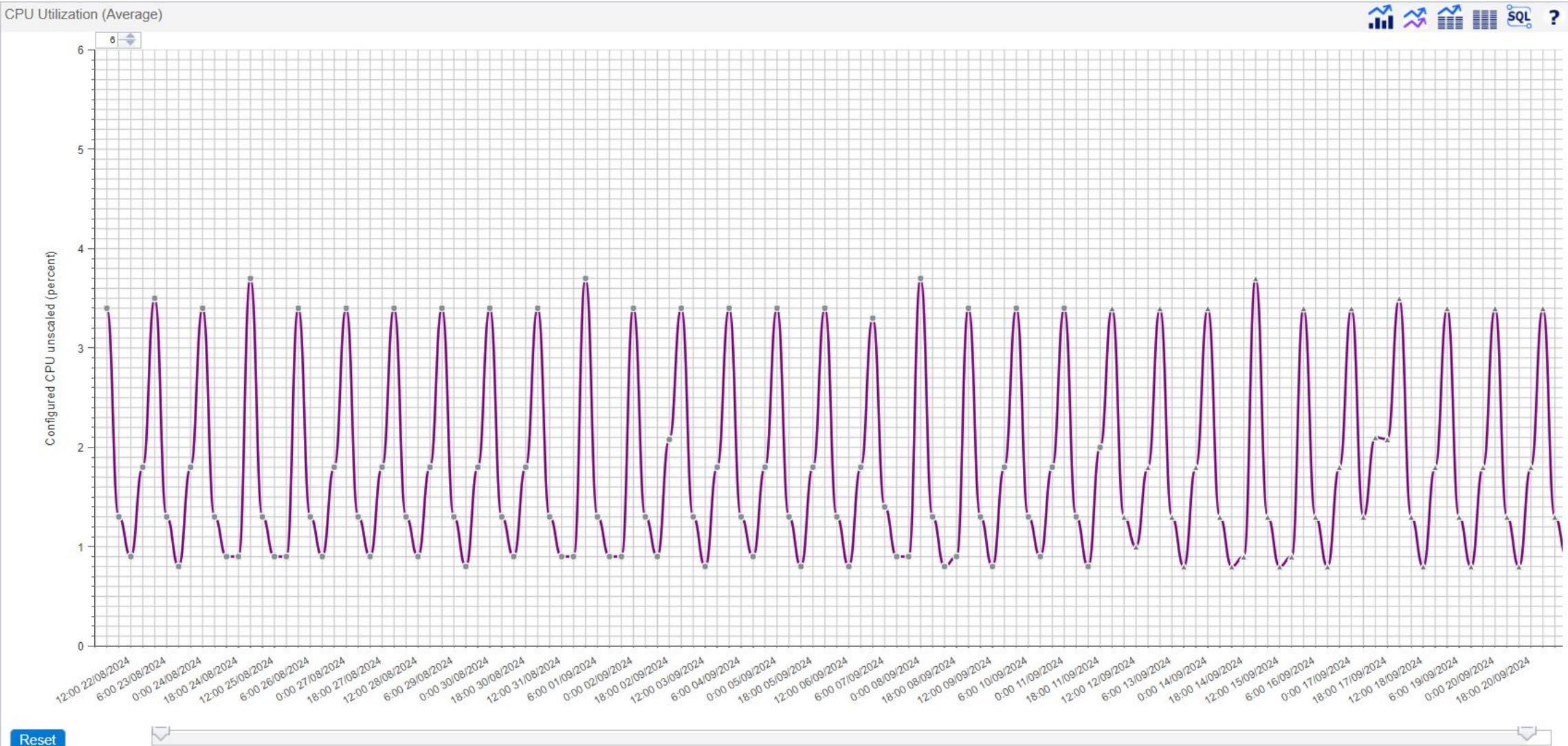
172.168.2.32
Active sql

Performance

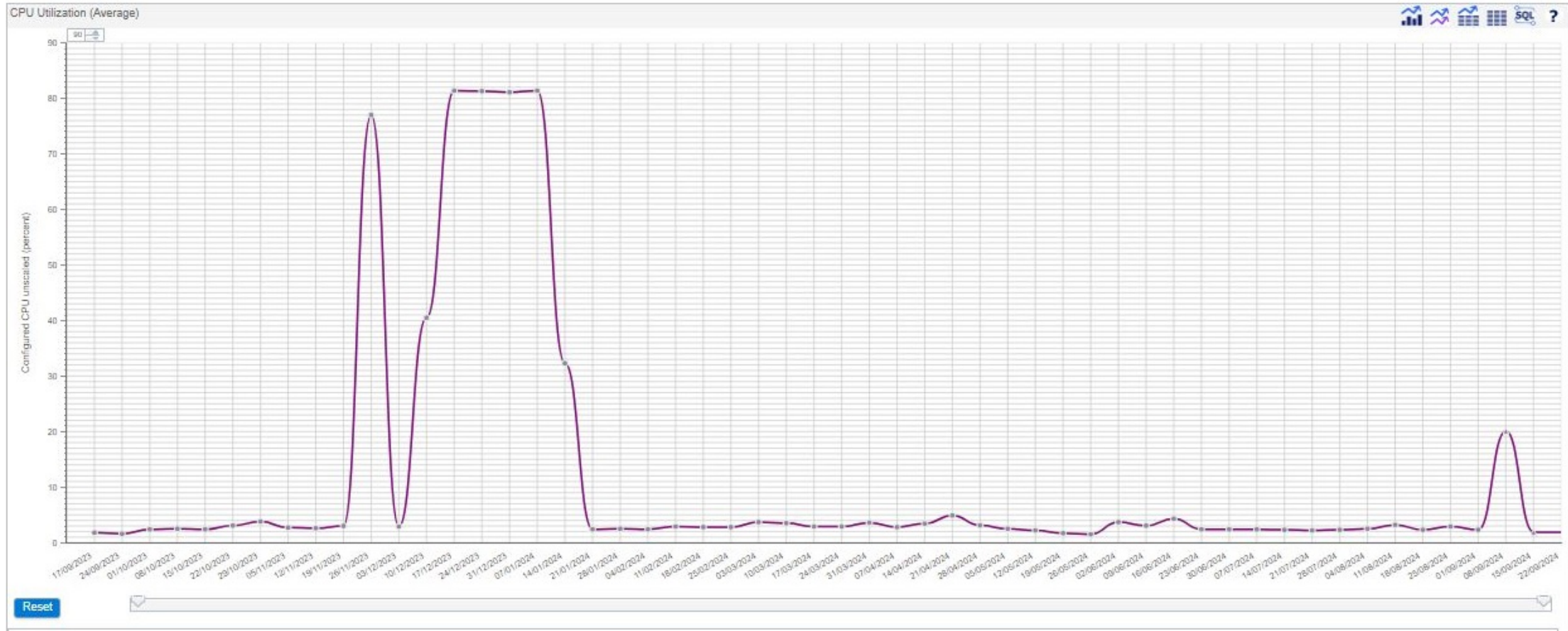
- Investigate Data
- > Manage Collections
- Collection Services Configuration
- Graph History - Summary**
- Graph History - Details

View graph history summary

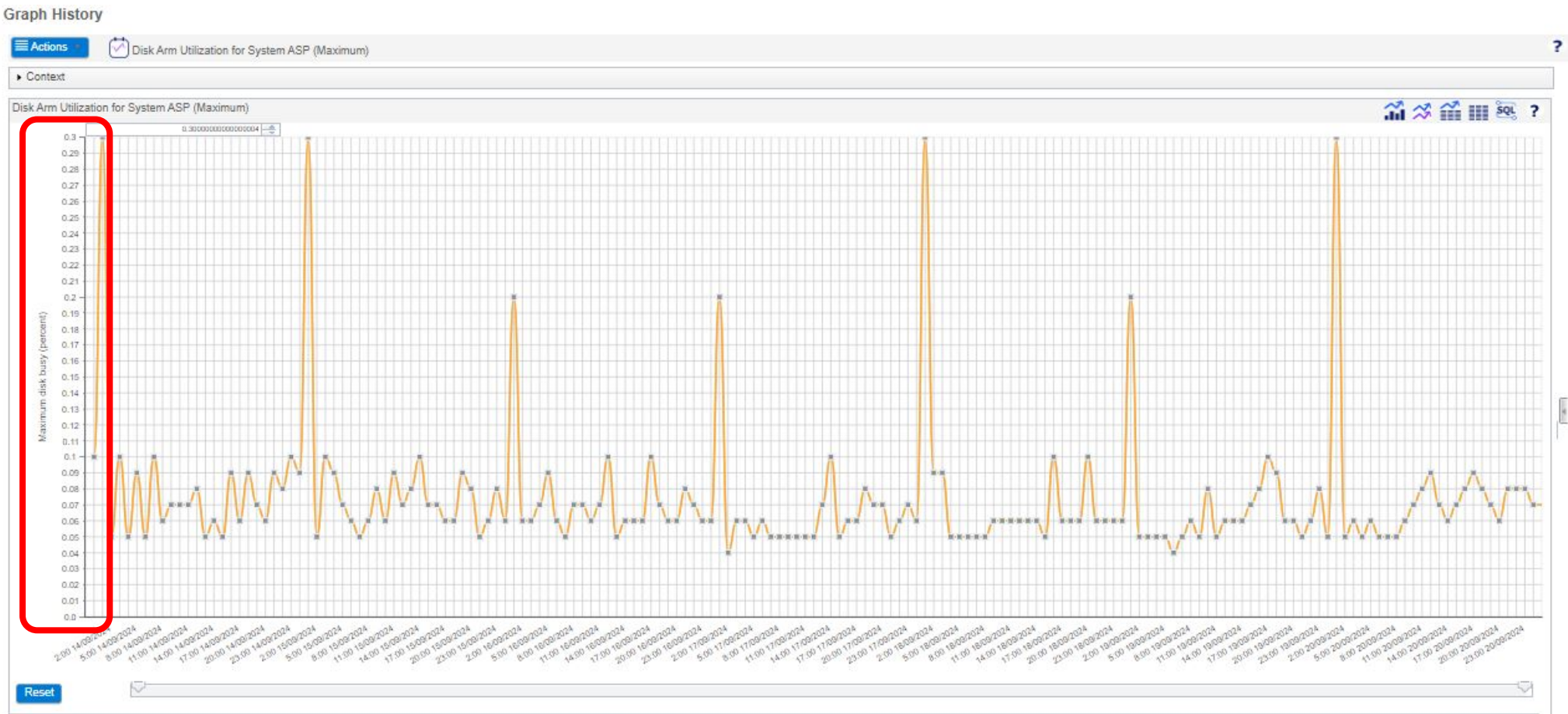
Graph History – Processor Usage with a regular pattern



Graph History – Processor Usage – what is that spike?

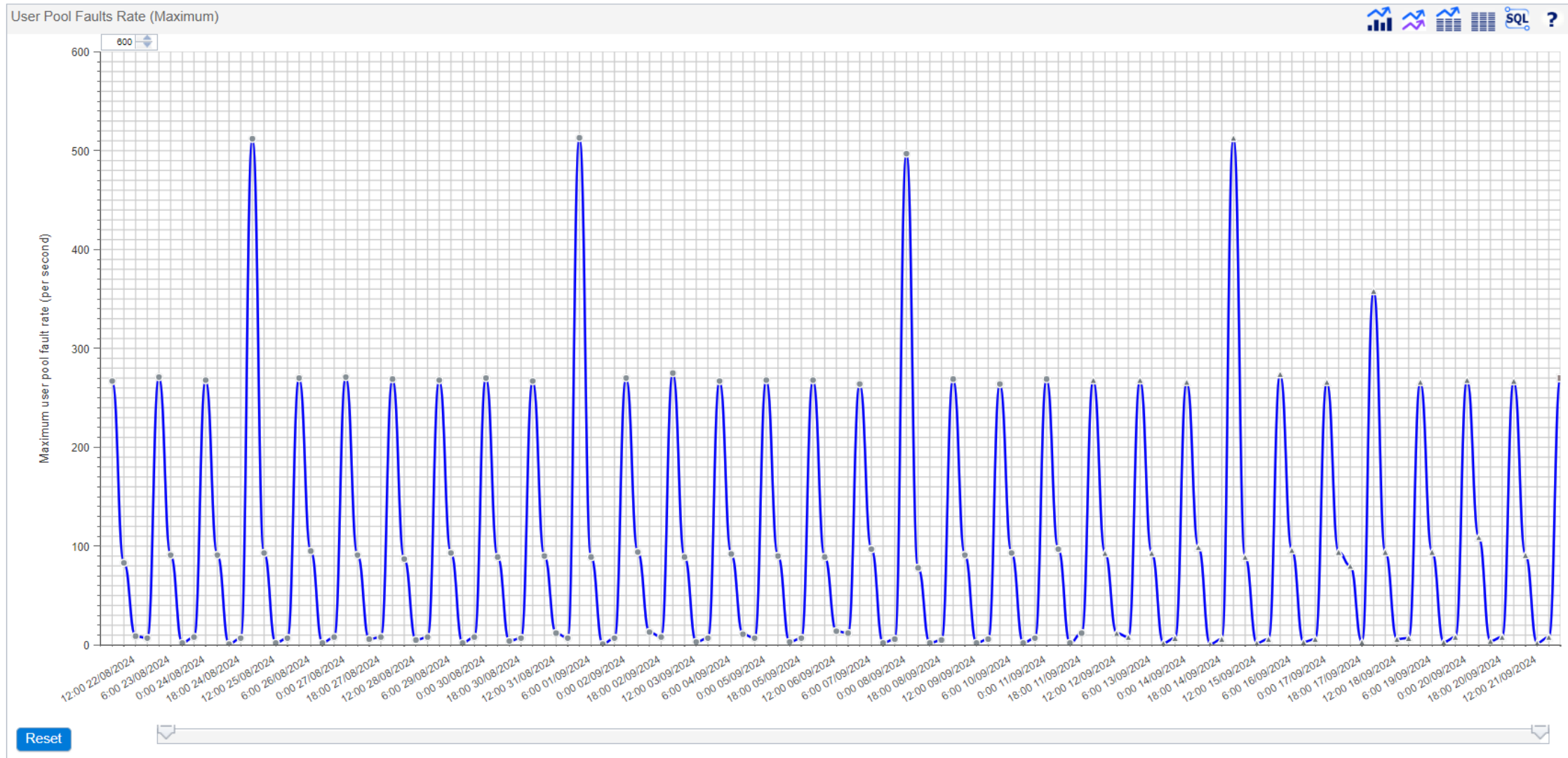


Graph History – Storage Usage



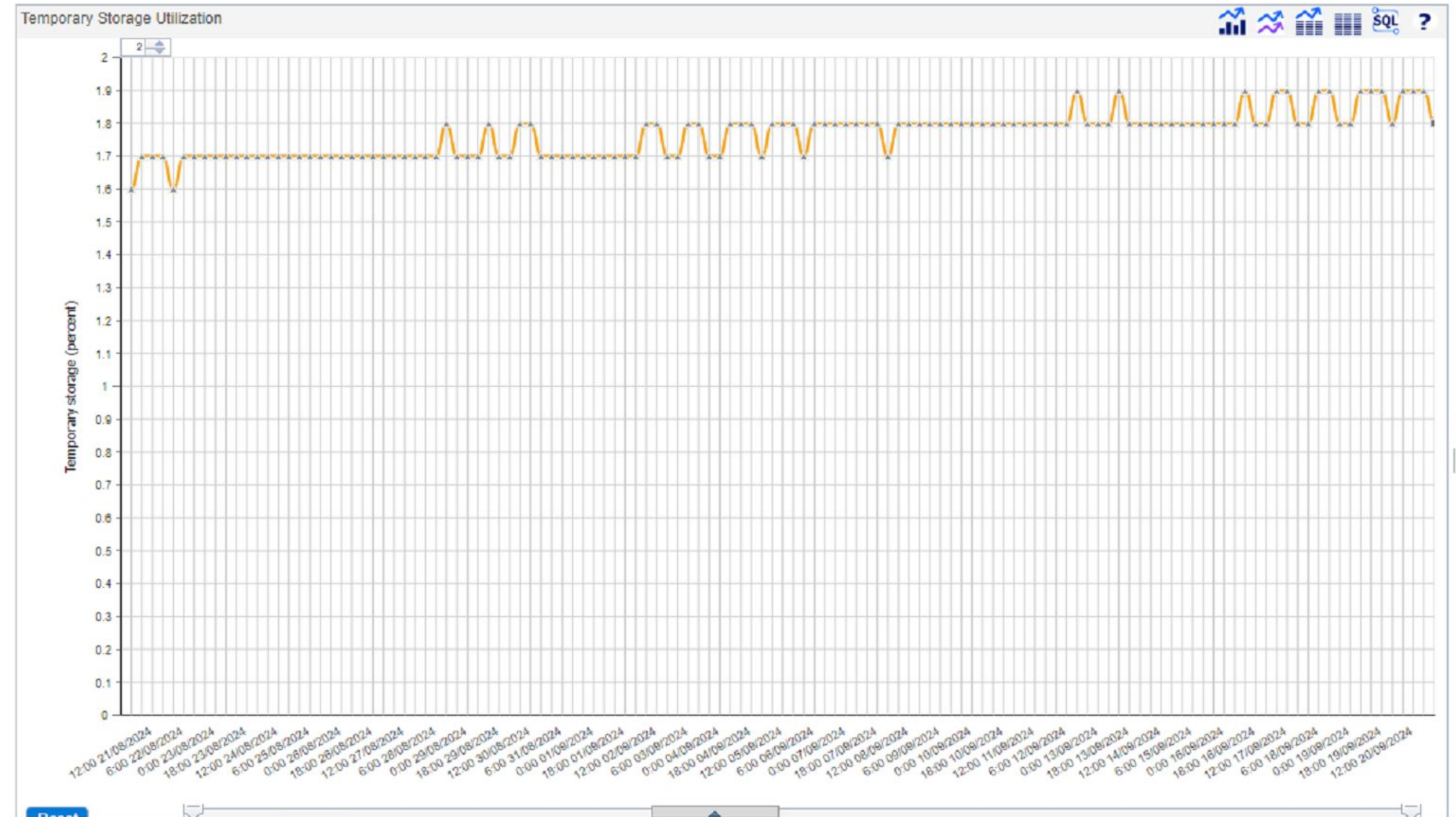
Be aware of your axis range, in this case from 0 to 0.3% so these peaks are Not a problem

Graph History – Memory Usage

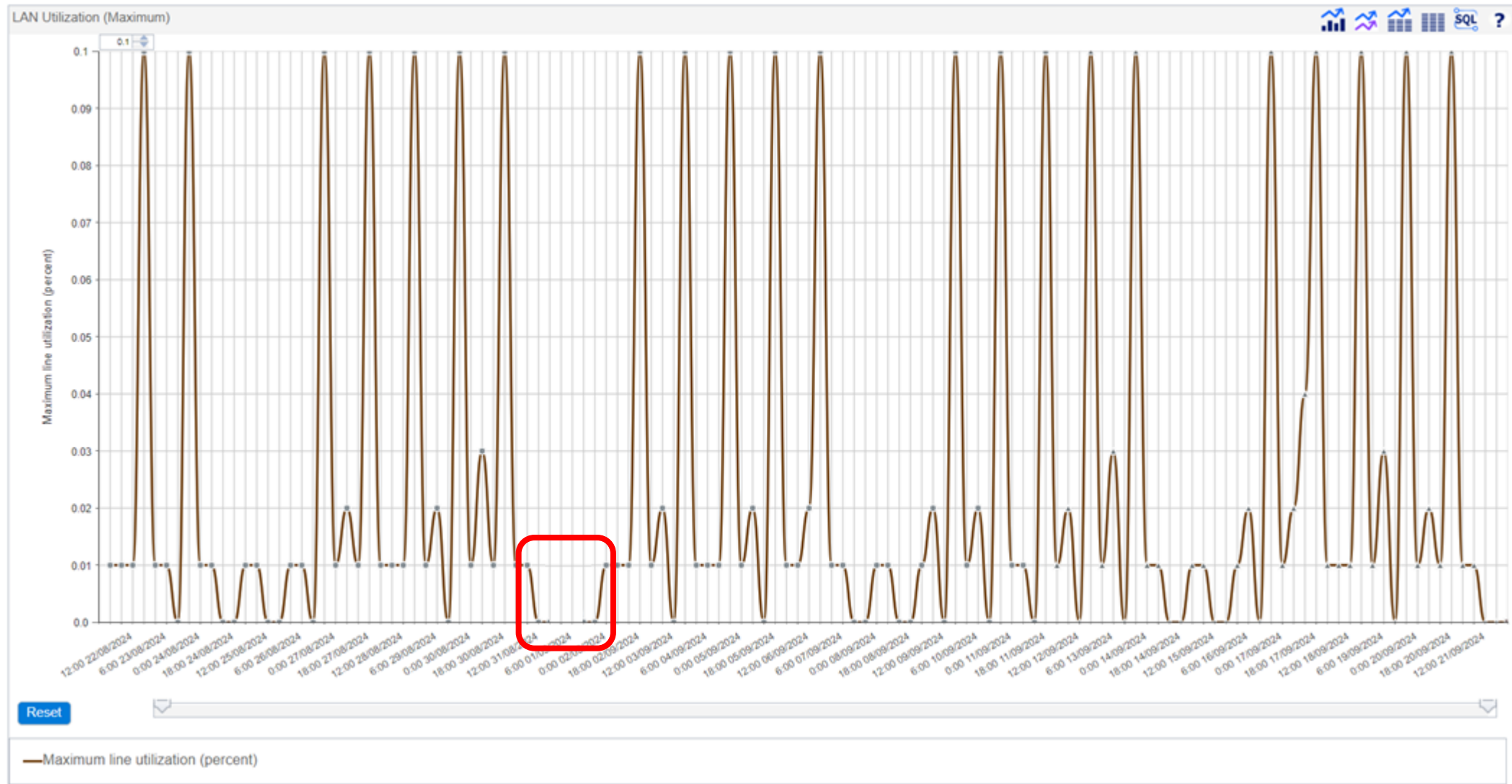


It's OK to have peaks, as long as they are legitimate, in this case weekly processes

Graph History – Temporary Storage Usage

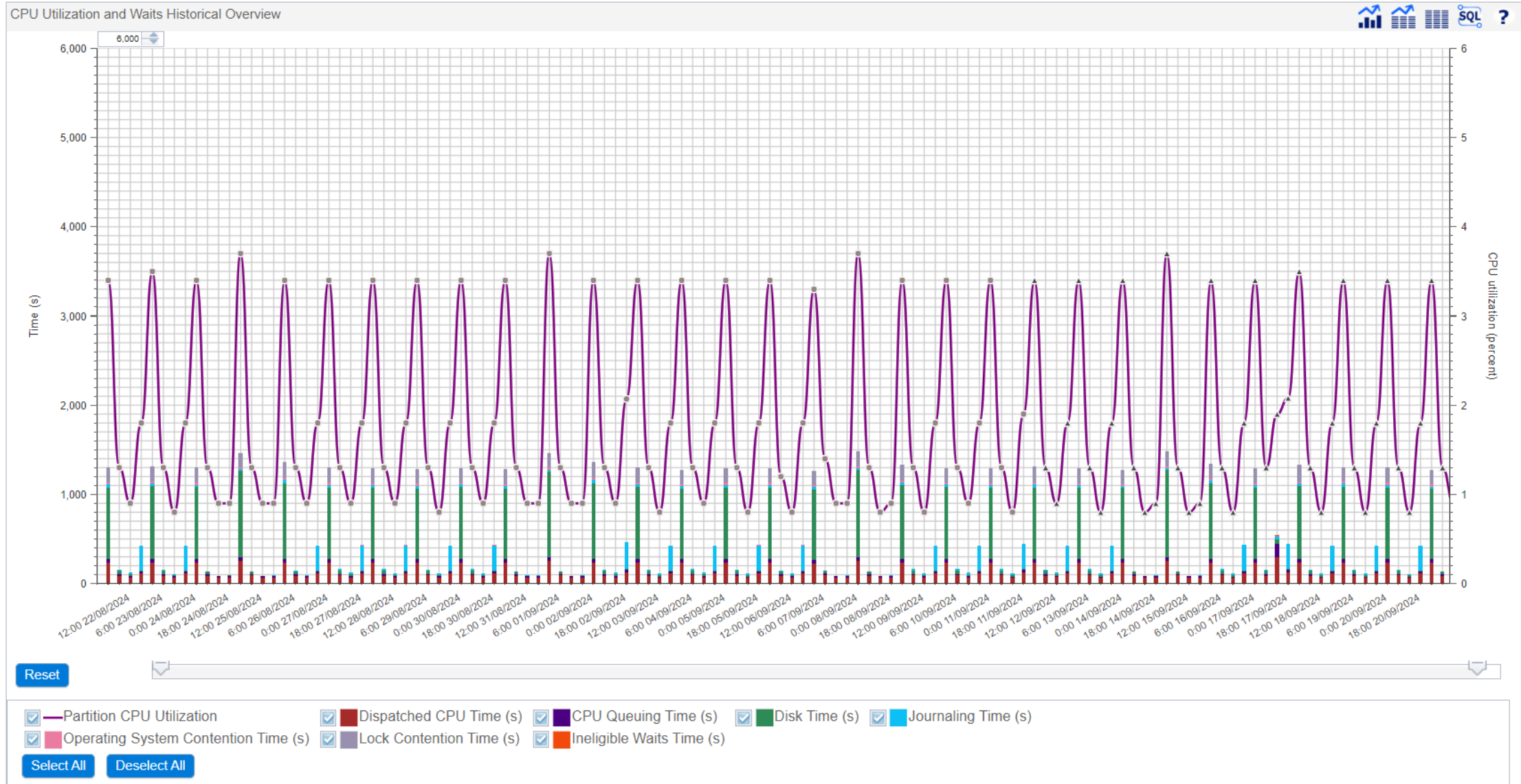


Graph History – Communications Traffic Usage



Watchout for network outages, these can be problems outside of IBM i that effect IBM i

Graph History – Wants a more holistic view?



You can customise these views to include the metrics you want & then export them!

Graph History – Know your system

If you know what normal looks like, then you can:

- ✓ Know whether the problem is your IBM i or not
- ✓ Know what type of problem you might have
- ✓ Know where to focus to fix the problem

Part 5

Add SQL Performance Center to your Toolbox

What is the SQL Performance Center all about?

- ✓ Plan Cache (Statements, Performance & Event Monitors, Snapshots)
- ✓ Index Advisor
- ✓ Maintained Temporary Indexes
- ✓ Index Evaluator
- ✓ Active Query Info
- ✓ SQL Details for Jobs

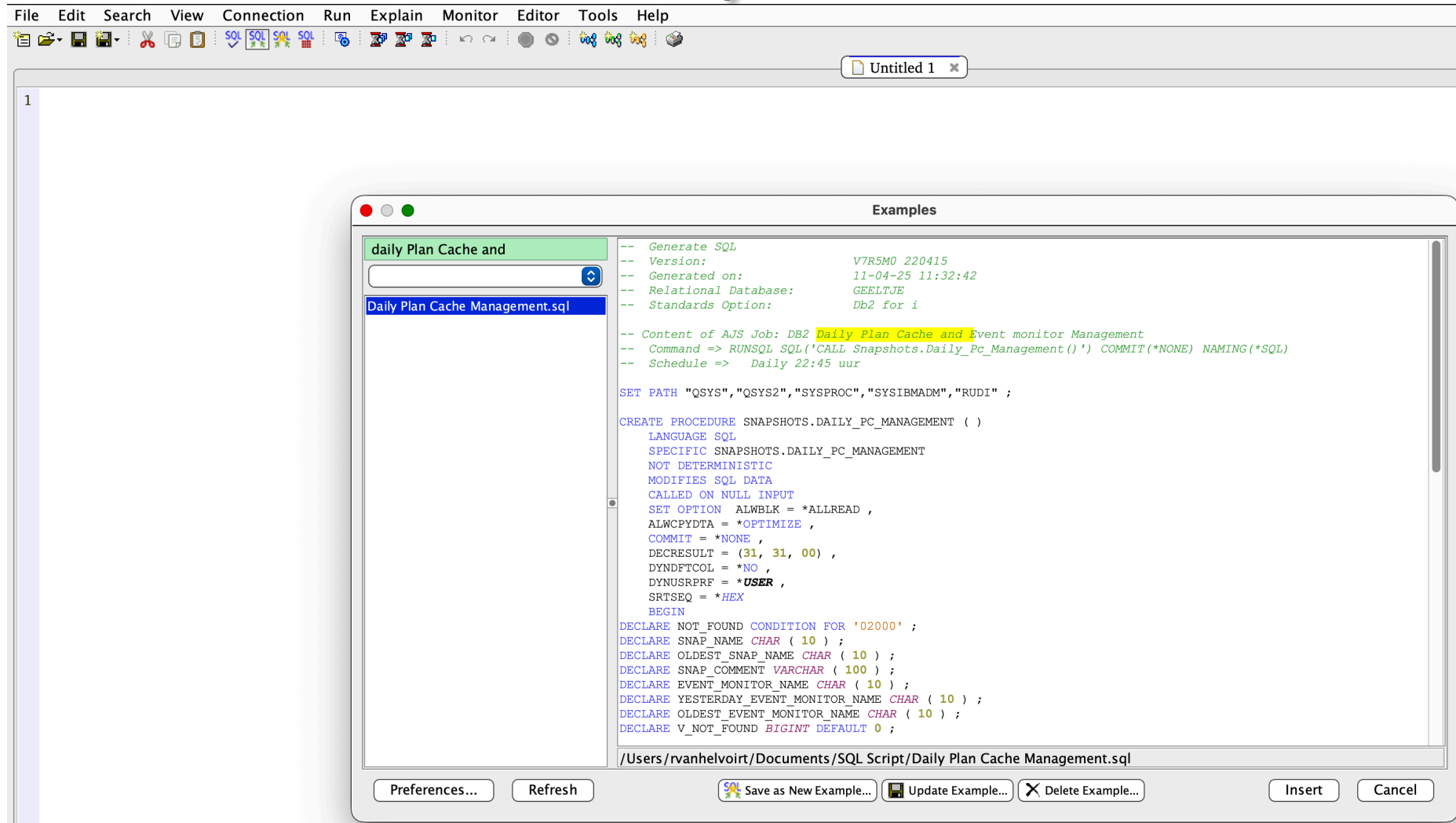
Start Exploring, start getting acquainted
The objective is to learn the value

SQL Performance Center

Prod Plan Cache Statements Index Advisor Maintained Temporary Indexes Index Evaluator Active Query Info SQL Details for Jobs		
Plan Cache Performance Monitors Plan Cache Snapshots Plan Cache Event Monitors		
Properties		
Description	Value	Value Unit
Tijdstip van overzicht	2025-11-14-14.16.09.944102	
Tijd van maken plancache	2025-10-17-15.37.09.767330	
Overzicht actieve query		
Aantal momenteel actieve query's	1714	
Aantal uitgevoerde query's sinds begin	95006559	
Aantal keren dat query volledig is geopend sinds begin	4724069	
Overzicht plangebruik		
Huidige aantal plannen in cache	27143	
Totaalaantal gebulde plannen sinds begin	123254	
Total Number of SMP Plans Built Since Start	26975	
Totaalaantal unieke query's sinds start	59056	
Huidige grootte plancache	4035	MB
Huidige drempel plancache grootte	4096	MB
Maximumgrootte plancache voor automatische grootte	*DISABLED	
Huidige hit-ratio plancache	97	%
Doel hit-ratio automatische grootte plancache	*DISABLED	
Total Number of Plan Cache Autosizing Adjustments	0	
Laatste aanpassing automatische grootte plancache	0000-00-00-00.00.00.000000	
Last Autosizing Limited Due to Temporary Storage	0000-00-00-00.00.00.000000	
Huidig aantal plannen met taakbereik (QTEMP)	4141	
Totaalaantal gebouwde plannen met taakbereik (QTEMP) sinds begin	5724	
Totaalaantal unieke begin met verwijzingen met taakbereik (QTEMP) sinds start	1456	
Totaalaantal keren dat plannen uit de cache zijn gebruikt	4600938	
Totaal verwijderde plannen	56733	
Totaalaantal opgeschoonde plannen	39300	
Aantal keren dat plancache is opgeschoond	31	
Plancache voor het laatst opgeschoond	2025-11-14-06.49.00.187468	
Time Most Recent Plan Added	2025-11-14-14.16.09.806422	
Huidig aantal tijdelijke runtime-objecten opgeslagen in cache	25093	
Huidige totaalgrootte van tijdelijke runtime-objecten in cache	37861	MB
Maximaal aantal tijdelijke runtime-objecten opgeslagen per plan	*DEFAULT (5)	
Totaalaantal gemaakte tijdelijke indexen	3304	
Huidig aantal tijdelijke indexen	109	
Current Total Size of Temporary Indexes	1712	MB
Aantal opnieuw opgebouwde plannen vanwege AQP	20	
Aantal fouten in query-toewijzing sinds begin	3849	
Configuratie plancache		
Huidige drempel plancache grootte	4096	MB
Maximumgrootte plancache voor automatische grootte	*DISABLED	
Doel hit-ratio automatische grootte plancache	*DISABLED	
Maximaal aantal langste uitvoeringen toegestaan per plan	*DEFAULT (3)	
Maximaal aantal tijdelijke runtime-objecten opgeslagen per plan	*DEFAULT (5)	
Drempelwaarden voor plancache-activiteiten		
Begin tijd activiteitsdrempelwaarden	2025-10-17-15.37.09.768264	
Hoogste aantal tegelijk actieve query's	2373 (2025-10-23-14.25.48.128063)	
Hoogste aantal plannen in cache	27667 (2025-11-10-22.21.00.132370)	
Hoogste aantal tijdelijke runtime-objecten opgeslagen in cache	27643 (2025-10-28-20.07.19.327523)	
Grootste totaalgrootte van tijdelijke runtime-objecten in cache	51115 (2025-11-02-04.09.16.161147)	MB
Query Supervisor		
Number of thresholds reached	0	
Most thresholds reached threshold		
Done: 54 rows retrieved.		

You do not want to see a date behind the Last Autosizing Limited Due to Temporary Storage row!

SQL Performance Center History



TIP: Wait for the next version of IBM i Acces Clients Solution GA next month

Part 6

How Much Downtime do I need for my backups?

How Much Downtime do I need for my backups?

- None, you do not need down time for backups
- As long as you have invested in one of the following:
 - Db2 Mirror
 - PowerHA
 - External Storage with FlashCopy
 - Software HA Replication Tool
 - A blatant disregard for your data

How long will is Save 21 – Entire System Save

- This Backup is bootable and contains a complete snapshot of your system
- It forms a key part of many companies Disaster Recovery Strategy
- The problem however is that no one can use the system whilst you run it!
- Questions That I'm often asked:
 - How long will my Save 21 Take?
 - When was my Save 21 last run?

How long was my last Save 21? – Entire System Save

- You can find the answer to both how long and when was it last run with SQL

```
create or replace function systools.go_save_info ()
returns table (
  step_time timestamp(0), step_name varchar(16), device varchar(10)
)
begin
  declare pos int default 1;
  declare step int default 1;
  declare step_count int;
  declare dtaara_guts varchar(2000) ccsid 37;
  set dtaara_guts = (select data_area_value
    from qsys2.data_area_info
    where data_area_library = 'QUSRSYS'
      and data_area_name = 'QSRSAV21');
  set step_count = length(rtrim(dtaara_guts)) / 50 + 1;
  while (step <= step_count) do
    pipe (
      timestamp_format(substr(dtaara_guts, pos, 14), 'YYYYMMDDHH24MISS'),
      case
        when rtrim(substr(dtaara_guts, pos + 15, 10)) = '*****I'
        then 'GO SAVE Complete'
        else rtrim(substr(dtaara_guts, pos + 15, 10))
      end,
      substr(dtaara_guts, pos + 26, 10)
    );
    set pos = pos + 50;
    set step = step + 1;
  end while;
  return;
end
```

```
select *
from table (
  systools.go_save_info()
)
order by step_time desc;
```

STEP_TIME	STEP_NAME	DEVICE
2024-01-03 21:22:41	SAVSYS	TAP01
2024-01-03 21:26:27	SAVLIB	TAP01
2024-01-03 21:38:06	SAVDLO	TAP01
2024-01-03 21:38:12	SAV	TAP01
2024-01-03 21:40:29	SAVIASPS	TAP01
2024-01-03 21:40:29	STRSBS	
2024-01-03 21:40:29	GO SAVE Complete	
2024-03-13 16:18:45	SAVSYS	TAP02
2024-03-13 16:22:12	SAVLIB	TAP02
2024-03-13 16:40:47	SAVDLO	TAP02
2024-03-13 16:40:59	SAV	TAP02
2024-03-13 16:44:06	SAVIASPS	TAP02
2024-03-13 16:44:07	STRSBS	
2024-03-13 16:44:07	GO SAVE Complete	

Questions ?