Domino on IBM i

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Kim Greene - Introduction

- Owner of Kim Greene Consulting, Inc.
- Extensive iSeries and Lotus Domino background
- Services offered include:
  - System and application performance optimization
  - Administration
  - Upgrades
  - Troubleshooting
  - Health, performance, security, etc. checks
  - Migrations
  - Custom development
  - Enterprise integration
- Blog: www.bleedyellow.com/blogs/dominodiva
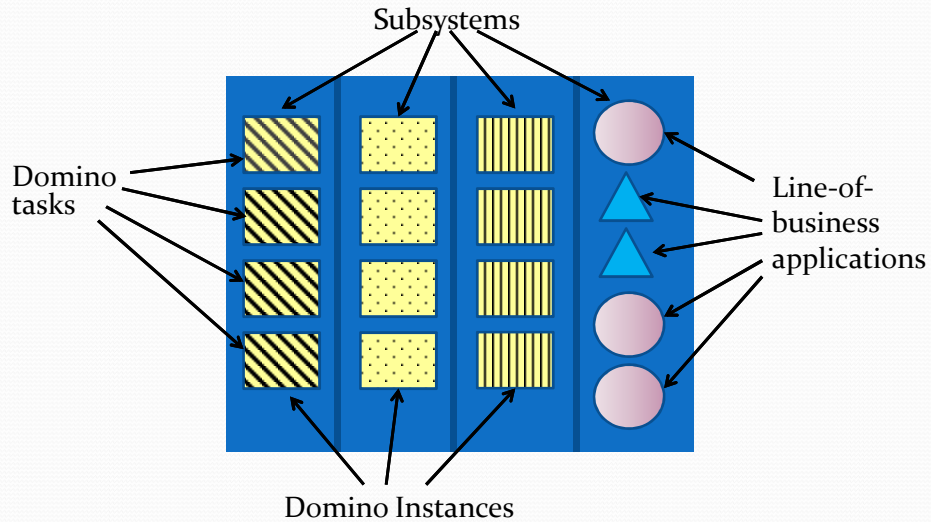- Twitter: iSeriesDomino

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Agenda

- IBM i architecture
- Domino on IBM i
  - Object ownership
  - QNNINSTS
  - Multi-version support
  - Domino commands
  - Sort sequence and locking
  - Log files
- Domino on IBM i performance tricks
  - Run priority
  - Automatic performance adjustor
  - Graphical performance monitoring
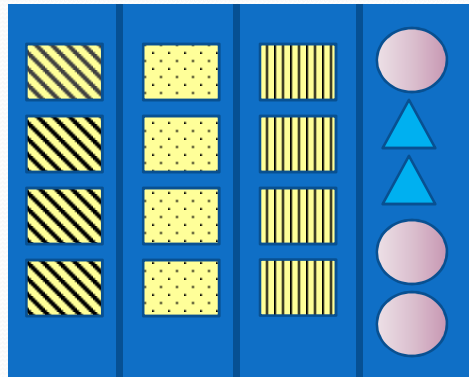 - Balancing disk I/O

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IBM i Architecture

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IBM i Architecture

Subsystems

Domino tasks

Line-of-business applications

Domino Instances

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IBM i Architecture

- **One** Domino license
- **Shared** memory
- **Shared** disk
- **Shared** processor cycles
- **Shared** printers
- **One** tape backup
- **Shared** Domino release options

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Domino on IBM i

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Domino on IBM i

- Object ownership
  - QNOTES user profile
    - All Domino objects need to be owned by this special profile

- QNNINSTS
  - Watchdog job
    - Controls all sever functions

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Domino on IBM i

- Partitioned installs
  - All Domino installs are partitioned installs
    - Domino product code is stored separate from Domino server
      - Product code located in /QIBM/ProdData/Lotus/Dominoxxx directory
      - Release 8.5.3 code store is
        - /QIBM/ProdData/Lotus/Domino853

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Multi-Version Support

- Just imagine …

  - Running multiple versions of Domino on a one IBM i partition

  - Testing a new Domino release within your current Domino environment

  - Selecting for each of your Domino servers the release of your choice

  - Updating your Domino servers "on demand"

  - Installing a new release of Domino while your Domino servers are up and running

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Multi-Version Support

- Domino installs and upgrades can be separate steps
  - Install code anytime
  - Upgrade server when ready

Update Domino Server (UPDDOMSVR)

Type choices, press Enter.

Server name . . . .   _____

_____   + for more values

To release level . . . .   *LATEST   F4 for list

Multi-Version Support

- Domino Integrated File System (IFS) directory structure

Item	IFS Directory
Release specific information	/QIBM/ProdData/Lotus/QDOMINOxxx
Common product information (symbolic link to primary release)	/QIBM/ProdData/Lotus/Notes
Customization information	/QIBM/UserData/Lotus/Notes
Domino server data directory	Specified when configuring the Domino server

Fix Packs and Hotfixes

- Domino Fix packs and Hotfixes
  - Apply once and installed for all Domino servers running that release

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Domino Commands

- WRKDOMSVR
- CHGDOMSVR
- CFGDOMSVR

- Library qualify to go back to a prior release level that is installed
  - QDOMINO852/CFGDOMSVR ....

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Domino Commands

- Work with Domino Servers (WRKDOMSVR)

Work with Domino Servers

System: IUSR007

Type options, press Enter.
1=Start server   2=Change server   5=Display console   6=End server
7=Submit command   8=Work console   9=Work server jobs
11=Change current directory   12=Work object links   13=Edit NOTES.INI

Opt	Domino Server	Domino Subsystem	Status
___	DOMSERVER1	DOMSERVER1	*STARTED
___	DOMSERVER2	DOMSERVER2	*ENDED
___	DOMTEST5	DOMTEST5	*STARTED
___	DOMTEST1	DOMTEST1	*STARTED
___	DOMTEST2	DOMTEST2	*STARTED
___	DOMTEST3	DOMTEST3	*ENDED

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Domino Commands

- Work with Domino Servers (WRKDOMSVR)

Work with Domino Servers

System: IUSR007

Type options, press Enter.
14=Work with support files   15=Work with NSDs   16=Dump server call stacks
17=Create NSD

Opt	Domino Server	Domino Subsystem	Status
___	DOMSERVER1	DOMSERVER1	*STARTED
___	DOMSERVER2	DOMSERVER2	*ENDED
___	DOMTEST5	DOMTEST5	*STARTED
___	DOMTEST1	DOMTEST1	*STARTED
___	DOMTEST2	DOMTEST2	*STARTED
___	DOMTEST3	DOMTEST3	*ENDED

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Domino Commands

- Run Domino Command (RUNDOMCMD)
  - Runs Domino command at operating system level in context of Domino server

Run Domino Command (RUNDOMCMD)

Type choices, press Enter.

Server name . . . . > domtest2

Command . . . . > CALL PGM(QNOTES/COMPACT) PARM(NAMES.NSF '-C')

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Sort Sequence and Locking

- IBM i is an EBCDIC system
  - Most other platforms are ASCII
  - Affects sort order
  - Use care when FTPing to/from system
    - See technote 21447140 for details

- Different locking mechanism
  - Don't map network drives to server's data directory
    - Can cause data corruption

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Log Files

- History log
  - Tells what is happening on the IBM i server / LPAR
    - DSPLOG OUTPUT(*PRINT)
- System operator message queue
  - Great place to determine why a Domino server isn't starting
    - DSPMSG MSGQ(QSYSOPR)
- QNOTES spooled files
  - Spooled output of all Domino server jobs
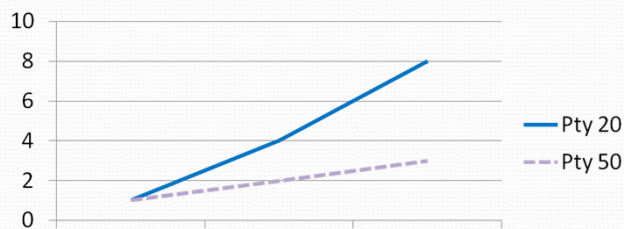   - WRKSPLF SELECT(QNOTES)

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Domino on IBM i Performance Tricks

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Performance – Run Priority

- Adjusting run priorities
  - Band 0: 0-9 (system tasks)
  - Band 1: 10-16
  - Band 2: 17-22
  - Band 3: 23-35
  - Band 4: 36-46
  - Band 5: 47-51
  - Band 6: 52-89
  - Band 7: 90 … Band 16: 99

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Performance – Run Priority

- Choosing a run priority band
  - Run priority bumped up faster for a higher priority task

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Performance – Run Priority

- Changing run priorities
  - Especially important if have Domino running with other workloads
    - Domino = 20
    - Interactive = 20
    - Web server (QHTTPSVR) = 25

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Performance – Run Priority

- Two ways to change run priorities

  - Change class
    - CHGCLS CLS(QUSRNOTES/DOMINOSRVR) RUNPTY(30)

  - Change individual job run priorities

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Performance – Run Priority

- Change individual job priority permanently
  - Useful when specific task is consuming too much CPU
  - Helpful when Domino runs on same system as interactive applications

- Steps to follow:
  - Create a class in library QUSRNOTES
    - CRTCLS CLS(QUSRNOTES/MAILCLASS1) RUNPTY(30)
  - Tell Domino which task (or tasks) should use this class
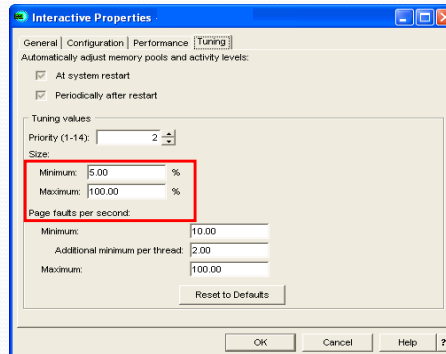   - EDTF ('/qibm/userdata/lotus/notes/domino_classes')

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Performance – Run Priority

- Contents of DOMINO_CLASSES file

```
SERVER=Mail01
CLASS=mailclass1
TASKS=calconn,router
CLASS=mailclass2
TASKS=sched
SERVER=App01
CLASS=appclass
TASKS=Amgr
```
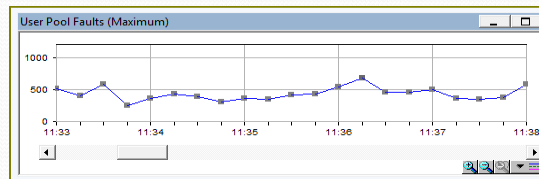
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Automatic Performance Adjustor

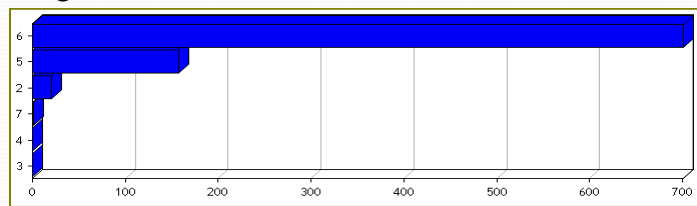- Memory pool size minimums and maximums are used by automatic performance adjustor (QPFRADJ)

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Graphical Performance Monitoring
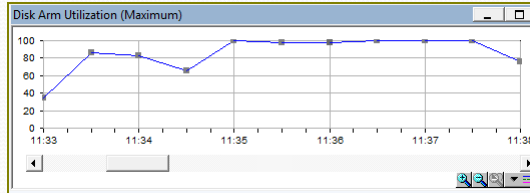
- Graphical tools provide details of system level performance
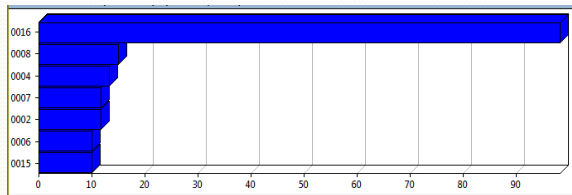

- Drilling down further

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Disk Balancing Act

- When disk is a bottleneck

- Important to look at *individual* disk arm utilization

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Disk Balancing Act

- Addressing disk I/O imbalance issue
  - Rebalance data according to usage statistics
    - Use Trace ASP Balance to collect usage statistics
      - TRCASPBAL SET(*ON) ASP(*ALL) ASPDEV(*ALLAVL) TIMLMT(*NOMAX)
      - TRCASPBAL SET(*OFF) ASP(*ALL) ASPDEV(*ALLAVL)
    - Use Start ASP Balance to rebalance the data
      - STRASPBAL TYPE(*USAGE) ASP(*ALL) TIMLMT(*NOMAX)
        - *Can be I/O intensive, schedule for off-hours!!*

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Add-on Products

- Lotus Quickr

- Lotus Enterprise Integrator

- Sametime Servers:
  - Sametime Community Server
  - Sametime System Console
  - Sametime Meeting Server

- Product Compatibility Guide
  - http://www-03.ibm.com/systems/resources/systems_power_ibmi_lotus_releasesupport.pdf

Only 1 release level of Domino Add-on products supported per LPAR

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IBM i Support for Domino Releases

	IBM i 7.1 [1]	IBM i 6.1 [1] and i 6.1.1	IBM i 5.4 and i 5.4.5
Domino 8.5.1, 8.5.2, 8.5.3	X	X	X [2]
Domino 8.5	Not supported	X	X [2]
Domino 8.0.1, 8.0.2	Not supported	X [2]	X
Domino 8.0	Not supported	Not supported	X

- Note 1: [2] indicates a program conversion will occur
- Note 2: Support for Domino 7.0.x ended on April 30, 2011

- IBM i Release Compatibility Guide can be found here:
  - http://www-03.ibm.com/systems/resources/systems_power_ibmi_lotus_releasesupport.pdf

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Extended Product Release Compatibilities

	8.5.3	8.5.2	8.5.1	8.5	8.0.2	8.0.1	8.0
Sametime 8.5.2 IFR1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sametime 8.5.1, 8.5.2	No	Yes	Yes	Yes	Yes	Yes	Yes
Sametime 8.5	No	No	Yes	Yes	Yes	Yes	Yes
Sametime 8.0, 8.0.1, 8.0.2	No	No	No	No	Yes	Yes	Yes
Lotus Quickr 8.5, 8.5.1 for Domino	No	No	Yes	No	No	No	No
Lotus Quickr 8.2	No	No	Yes [1]	Yes	No	No	No
Lotus Quickr 8.1	No	No	No	No	Yes [1]	Yes	No
Workflow 7.0	No	Yes	Yes	Yes	Yes	Yes	Yes
LEI 8.5.3	Yes	No	No	No	No	No	No
LEI 8.5.2	No	Yes	No	No	No	No	No
LEI 8.5.1	No	No	Yes	No	No	No	No
LEI 8.5	No	No	No	Yes	No	No	No
LEI 8.0.2	No	No	No	No	Yes	No	No
LEI 8.0.1	No	No	No	No	No	Yes	No
LEI 8.0	No	No	No	No	No	No	Yes
Domino Fax V4R5 [2]	Yes [2]	Yes [2]	Yes [2]	Yes [2]	Yes [2]	Yes [2]	Yes [2]

- **Notes:**
  1. Lotus Quickr does not always support new Domino MRs. Before upgrading a Lotus Quickr server to a later Domino release, verify that an enabling fix is available for that release: www.ibm.com/systems/i/software/quickr/. All Lotus Quickr servers in the same LPAR must use the same Domino release.
  2. Domino Fax was withdrawn from marketing in January, 2011, and end of support is April 30, 2012. A Domino Fax update is required for Domino 8.0.x and 8.5.x. See www.ibm.com/systems/i/software/domino/related/fxd/faxupdates.html
  3. Support for Lotus Domino 7.0.x, Lotus Quickr 8.0.x, and LEI 7.0.x ended on April 30, 2011. However, Domino 7.0.x can be used to run Domino Document Manager until support for that product ends on September 30, 2012
  4. Domino allows multiple releases within an LPAR; extended products allow one release installed per LPAR.

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Questions?

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