



IBM Software Group

Monitoring the Domino System Deep Dive Workshop

Lotus Society

Lotus software

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Agenda

- ✍ Domino Serviceability
- ✍ Domino 6 Monitoring
- ✍ Activity Trends
- ✍ Automatic Diagnostic Collection
- ✍ Domino Domain Monitoring

Demonstration



Domino Serviceability

- ✍ RAS = **R**eliability **A**vailability **S**erviceability
- ✍ RAS is the effort to improve the Domino Product suite so that:
 - ▶ Client/Server doesn't crash or hang as often (**R**eliability)
 - ▶ Client/Server performs well, Server is available to clients (**A**vailability)
 - ▶ The ability to quickly pin-point and fix problems (**S**erviceability)
- ✍ Most recent wave of improvements occurred in ND6.5.5 and ND7.0, with on-going changes where appropriate in each MR / Major Release.

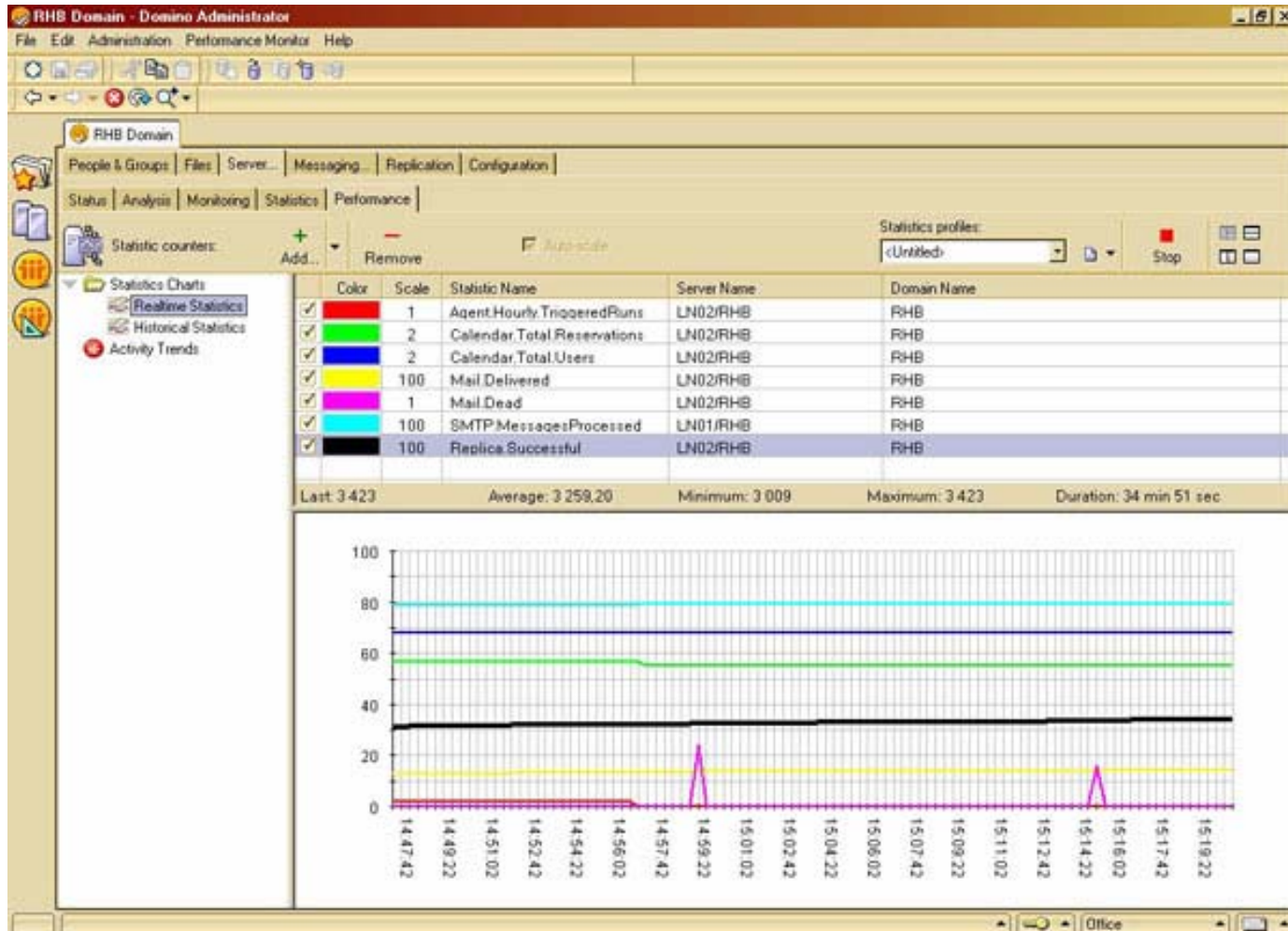


Domino 6 Monitoring

- ✍ The **Monitoring Configuration** database (events4.nsf) holds the documents used to setup monitoring. It also includes information about statistics, statistic thresholds, and event messages.
- ✍ The **Monitoring Results** database (statrep.nsf) stores information about logged events and results of statistics reports.
- ✍ The **Log file** (log.nsf) is the central point of storing the Domino server's log documents.
- ✍ The **Event Monitor** server task determines if an event handler has been configured for the event.. Results are logged into the Monitoring Results database (statrep.nsf)
- ✍ The **Statistics Collector** server task gathers Domino server statistics and creates statistics reports in the Monitoring Results database.
- ✍ The **SNMP** server tasks interact with the LNSNMP agent to convert Domino monitoring and statistics to SNMP traps and Management Information Base (MIB)-defined variables.



Domino 6 Monitoring - Charting





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Activity Trends

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Activity Trends

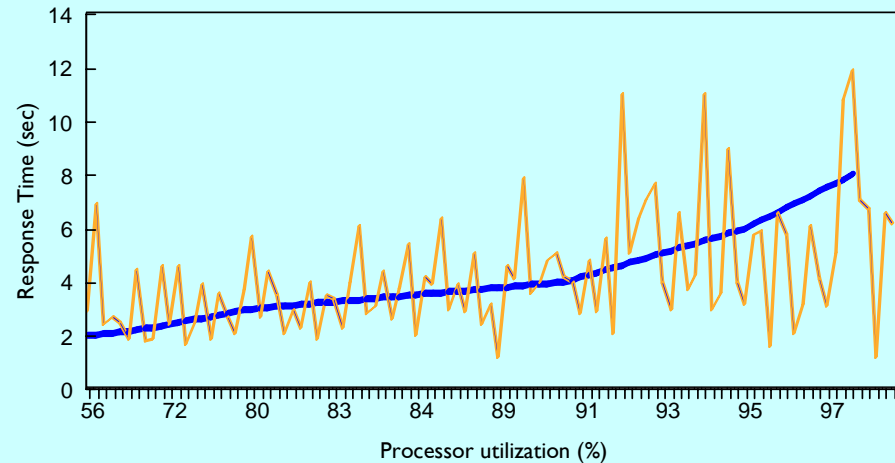
Formerly available with Tivoli Analyzer

- ✍ A capacity planning and resource/load balancing tool for Domino domains
- ✍ Gathers and analyzes Domino activity data
- ✍ Resource balance many Domino servers by moving databases across servers
- ✍ Provides automated change management with full administration-cycle support



Activity Trends -- Why Load Balance?

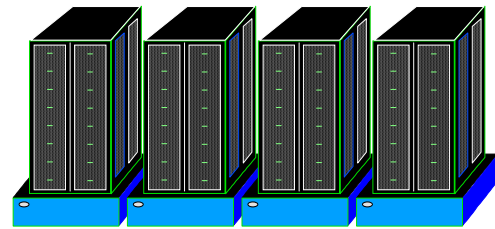
- ✍ Domino response varies with load
- ✍ At high utilization, response is highly variable
- ✍ Want stable and predictable utilization
- ✍ Result: improved availability, better response times, and decreased costs



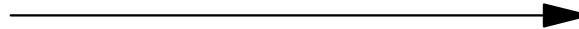
Activity Trends and the Autonomic Loop

Activity Trends -From Monitoring to Analysis to Plan to Execution...

Data Generation and Historical Analysis



*Activity Logging &
Activity Trends Collector*



Visual Analysis Tools

Domino Administrator Client

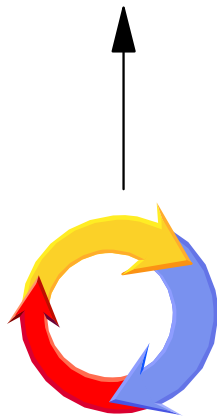


Problem Determination

Comparison Analysis

Capacity Planning

Resource Balancing



Change Automation

*Domino Change Manager
& Administration Process*



Getting the Data

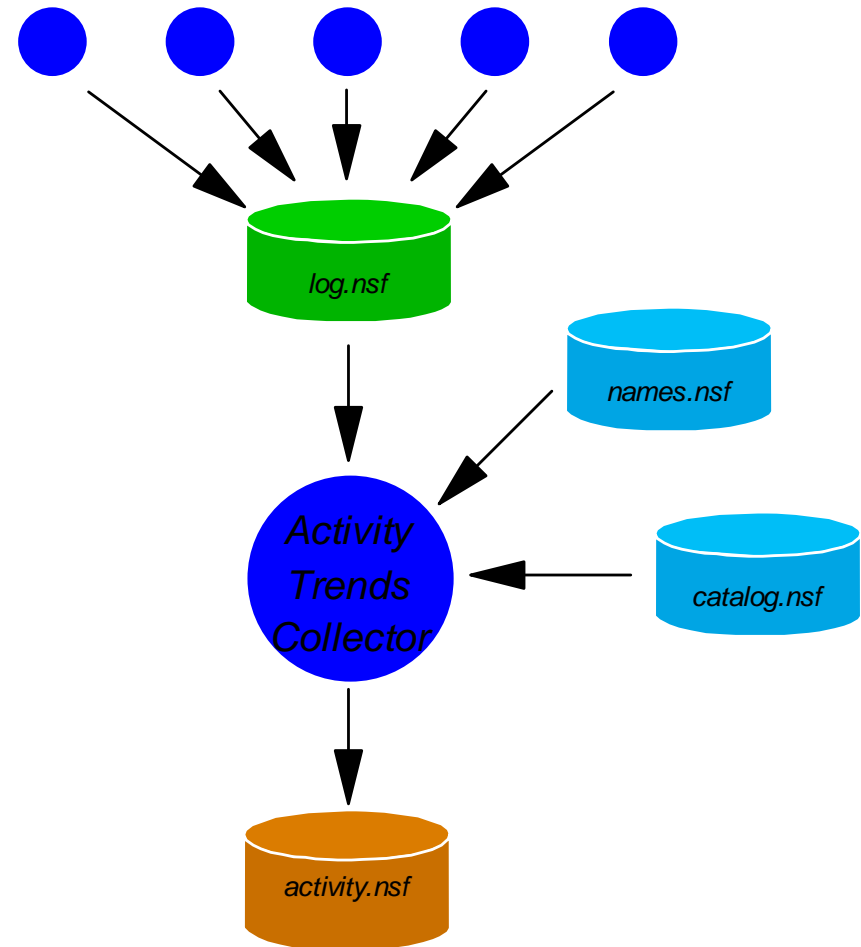
Activity Logging

- ▶ Server task writes performance data (binary) to the server log
- ▶ Activity data stream written to the standard server log (log.nsf)

Activity Trends Collector

- ▶ Processes performance data once a day
- ▶ Correlates with other data from different sources
- ▶ Performs historical analysis to predict future size and consumption rates for resources and “trends” the data
- ▶ Data is written to Activity Database for use by Activity Trends in the Domino Administrator client

Http, Pop3, Agent Mgr, NRPC Server, etc.



Used by Domino Administrator client

LOTUS Domain - Domino Administrator

File Edit Administration Resource Balancing Help

LOTUS Domain

People & Groups Files Server... Messaging... Replication Configuration

Status Analysis Monitoring Statistics Performance

Resource Balancing

Server profiles: + - <Untitled> Analyze

Available Databases Recommended Plan Current Profile Projected Profile

Statistic ... Show me 25 servers Showing 1 to 5 of 5 (normalized)

Profiles for Notes Transactions on selected servers

Server	Light (DBs)	Medium (DBs)	Heavy (DBs)
Rabbit	847	304	1,210
Possum	847	304	1,210
Penguin	847	304	1,210
Ibis	847	304	1,210
Beaver	847	304	1,210

Server: Rabbit/JK Toys
Stat: Notes Transactions
Units: transactions
Total: 1.00 M (DBs: 1,210)
Light: 319.08 K (DBs: 847)
Medium: 475.21 K (DBs: 304)
Heavy: 208.44 K (DBs: 59)

Tivoli software

on Configuration

Server profiles: + - <Untitled> Analyze

Statistic ... Show me 25 servers Showing 1 to 5 of 5 (normalized)

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Server	Light (DBs)	Medium (DBs)	Heavy (DBs)
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Tivoli software

Activity Trends Load Balancing

Statistics Charts

- Realtime Statistics
- Historical Statistics
- Activity Trends
 - Latest
 - Server
 - Database
 - User
 - Connections
 - Historical
 - Weekly
 - Daily
 - Resource Balancing

Available Databases Recommended Plan Current Profile Projected Profile

Statistic ... Show me 25 servers Showing 1 to 5 of 5 (normalized)

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Tivoli software



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Automatic Diagnostic Collection (ADC)

Lotus software



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Automated Diagnostic Collection

- ✍ Enables you to set up a mail-in database to collect the diagnostic information generated from the ND Client/Server crashes in one central repository.
- ✍ Configured through Server Configuration Document (servers)
- ✍ Configured through Desktop Settings Policies (clients)
- ✍ Ability to configure list of files to collect at time of crash
- ✍ Ability to limit attachment sizes
- ✍ Improved crash information contained within automatic e-mail notification



Setting Up ADC

- ✍ Server Configuration Document
 - ▶ Diagnostics Tab
- ✍ Fault Recovery Database (Indfr.nsf) as Mail-in Database

Diagnostic Collection Options

Mail-in Database for diagnostic reports:	Lotus Notes/Domino Fault Reports
Maximum size of diagnostic message including attachments (in MB):	50
Maximum size of NSD output to attach (in MB):	5
Maximum amount of console output file to attach (in KB):	10240
Diagnostic file patterns:	sem*
Remove diagnostic files after a specified number of days:	Yes
Number of days to keep diagnostic files:	30



Customising ADC Collection

- ✍ Limit the size of the message that ADC generates (red)
- ✍ Enter additional files to collect besides NSD and console log (green)

Diagnostic Collection Options

Mail-in Database for diagnostic reports:	Lotus Notes/Domino Fault Reports
Maximum size of diagnostic message including attachments (in MB):	50
Maximum size of NSD output to attach (in MB):	5
Maximum amount of console output file to attach (in KB):	10240
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Fault Report for Server Crash

Fault Report

Notes/Domino Version	Occurrences	Process Name	OS Version	Size
AJR7/MORELLO				
Build V70_M6_06302005 B	2	namgr	Windows 2000 5.0	2205539
Additional Occurrence (Exact fault on AJR7/MORELLO at 08/29/2005 11:08:24 AM)				

Diagnostic Data

Name: AJR7/MORELLO
 Notes/Domino Version: Build V70_M6_06302005 Beta 4 June 30, 2005
 Machine Name: IBM-78YTP07
 OS Version: Windows 2000 5.0
 Start Time: 08/29/2005 10:55:09 AM
 Crash Time: 08/29/2005 11:02:23 AM
 Uptime: 0 day(s) 00:07:14
 Error message: PANIC: semaphore invalid or not allocated
 Process: namgr
 Callstack:
 Panic
 OSLockSemInt
 OSLockSem
 OSWaitEvent
 WaitForSignal
 AddInMain
 NotesMain
 notes_main
 main
 mainCRTStartup
 Open Databases: <Not available>



Automatic Diagnostic Collection

- ✍ Fault Analyzer is the most important new feature within ADC
 - ▶ Requires ND7 Server and ND7 Directory Design
 - ▶ Runs as an Add-in task on the Domino Server
 - ▶ Analyzes all mail-in databases on the server and processes the crash files that have been sent to the mail-in databases
 - ▶ Attempts to match new occurrences of crash stacks against existing entries in the mail-in database, allowing for partial matches
 - ▶ Administrator can specify percentage threshold at which two stacks are considered a partial match (with an INI setting)
- ✍ Fault Reports Database
 - ▶ ND7 design contains new views for Fault Analyzer
 - ▶ Matched crashes are displayed with parent/child relationship
 - ▶ Administrator has ability to mark a crash as resolved



Fault Reports Database

- ✍ If FA does not find a match for a crash, it designates that new crash a “parent” crash (red below)
- ✍ If FA does find a match for a crash, it designates that new crash a “child” crash (blue below)
- ✍ Green check mark indicates a resolved crash

Notes/Domino Version	Occurrences	Unique IDs	Process Name	OS Version	Site
AJR7/MORELLO					
Build V70_M6_06302005 B	1	1	namgr	Windows 2000 5.0	22
✓ ⊕ Build V70_M6_06302005 B	2	1	namgr	Windows 2000 5.0	22
⊖ Build V70_M6_06302005 B	3	1	panic	Windows 2000 5.0	21
Additional Occurrence (Exact fault for AJR7/MORELLO on Build V70_M6_06302005 Beta 4 June 30, 2005 at 09/16/2005)					
Additional Occurrence (Exact fault for AJR7/MORELLO on Build V70_M6_06302005 Beta 4 June 30, 2005 at 08/30/2005)					
Build V70_M6_06302005 B	1	1	nfileret	Windows 2000 5.0	13



ADC Future Features

- ✍ Ability to configure ADC to have crash files sent to IBM, allowing IBM to analyze diagnostic data from many customers.
 - ▶ Provides much larger statistical base, identifying patterns that might not otherwise be apparent
 - ▶ Identifies common incidents, enabling IBM to focus special attention on potentially extensive problems
 - ▶ Allows IBM to further improve the content of our releases by fixing the "right" problems in a timely manner
 - ▶ Fault Analyzer can search an internal IBM SPR repository automatically for solutions to crashes experienced by customers
 - ▶ Saves time to research occurrences and possibly duplicate work
 - ▶ Resolution of issues can be provided to customers quickly
 - ▶ Currently a pilot program with several Premium Support customers. Contact your PSM for information.





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Domino Domain Monitoring (DDM)

Lotus software

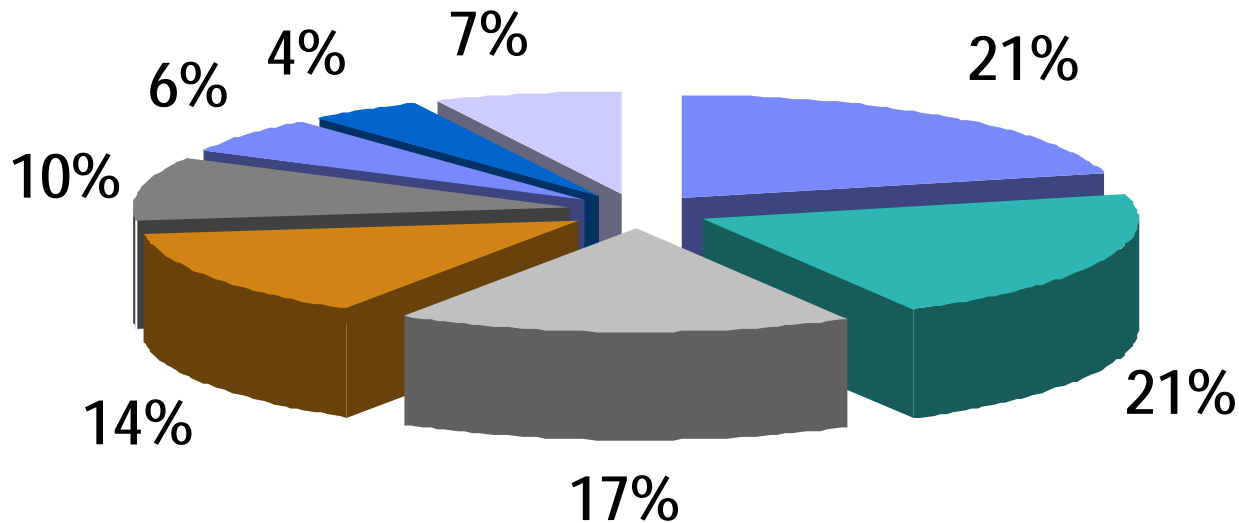


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Why DDM in Domino 7.0?

Survey results on administrative priorities

Domino Administrative Time



- | | |
|--------------------------------------|--|
| ■ Monitoring/Troubleshooting Servers | ■ Troubleshooting Clients/Desktop Mgmt |
| ■ Creating/Managing Users & Groups | ■ Install/Setup |
| ■ Application Management | ■ Messaging Admin |
| ■ Security Admin | ■ Miscellaneous |



Why Domino Domain Monitoring (DDM)?

 In a survey, Domino Administrators said:

- ▶ Domino 6.x provided new tools that reduce TCO
- ▶ Many usability and "polish" improvements

 However...

- ▶ Monitoring/troubleshooting servers takes too much time.
- ▶ Many problems across servers reported in many places.
- ▶ Correlation/analysis of lots of diverse data for complex problems is difficult.
- ▶ Need root cause analysis and corrective action context.



DDM Goals

- ✍ At the highest level, reduce TCO by providing a means to quickly monitor and determine the health of an entire domain at a single UI location and quickly resolve problems -- How?
 - ▶ Automate problem determination/analysis by feature (replication, messaging, directory, security, etc.)
 - ▶ Rollup, prioritize, and resolve problems across servers
 - ▶ Hide details until they are needed
 - ▶ Make DDM checks and reporting configurable and flexible
 - ▶ Be consistent with IBM Autonomic Computing (AC) vision
 - ▶ The DDM Five C's – Check, Collect, Consolidate, Correlate, Correct



DDM Architecture – Four Components

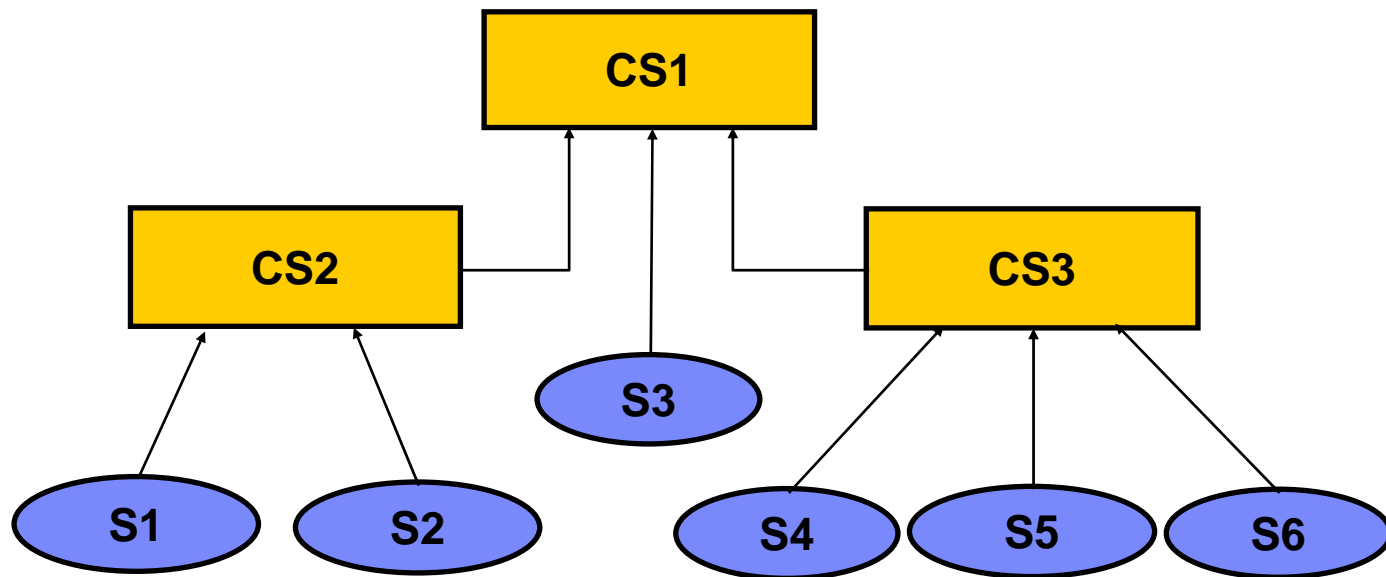
- ✍ Collection Hierarchy
- ✍ Probes organized by server features
 - ▶ Scheduled probes
 - ▶ Embedded probes
 - ▶ Listening probes
- ✍ Event filtering (DDM and non-DDM)
- ✍ User Interfaces
 - ▶ Configuration UI – events4.nsf
 - ▶ Reporting and storage UI – DDM.nsf



DDM Architecture – Collection Hierarchy

How to rollup information across all servers?

- ▶ CS = Collection Server
- ▶ DDM.nsf (storage and UI) lives on every server
- ▶ Information "rolled-up" via selective replication (self-configuring)
- ▶ Configuration is quick and highly flexible
- ▶ No hard hierarchy rules



DDM Architecture – Probes

- ✍ DDM probes are organized by feature/functional areas(9): Agents, Database, Directory, Messaging, OS, Replication, Security, Web, Server
- ✍ Three flavors of probes (some probes have more than one):
 - ▶ Scheduled probes run according to a configurable schedule, defaults supplied
 - ▶ Embedded probes "instrument" the feature area
 - ▶ Listening probes report miscellaneous non-DDM events
- ✍ Probe configuration is quick and flexible:
 - ▶ Defaults supplied for “out-of-box” value, probes can be quickly enabled/disabled
 - ▶ “Special target servers” allow instant probing without specifying named servers
 - ▶ Thresholds and content are highly customizable
 - ✍ what the probe will actually check
 - ✍ probe sensitivity (when will they generate an event)
 - ✍ what severity event the probe will generate



DDM Architecture – Event Filters

- ✍ 7.0 event filters control what and how much information is reported to DDM.nsf. Why?
 - ▶ Initial flood of events is striking, many of which have always been there
 - ▶ Over time, administrators will want to “adjust the volume”, seeing more or less of certain events
- ✍ Enhanced (DDM) and simple (non-DDM) events can be filtered.
- ✍ Filters can target specific servers and filter out events by event type/area and severity
- ✍ A default filter is supplied and enabled for simple events to reduce the initial “noise”.



DDM Architecture – Configuration UI

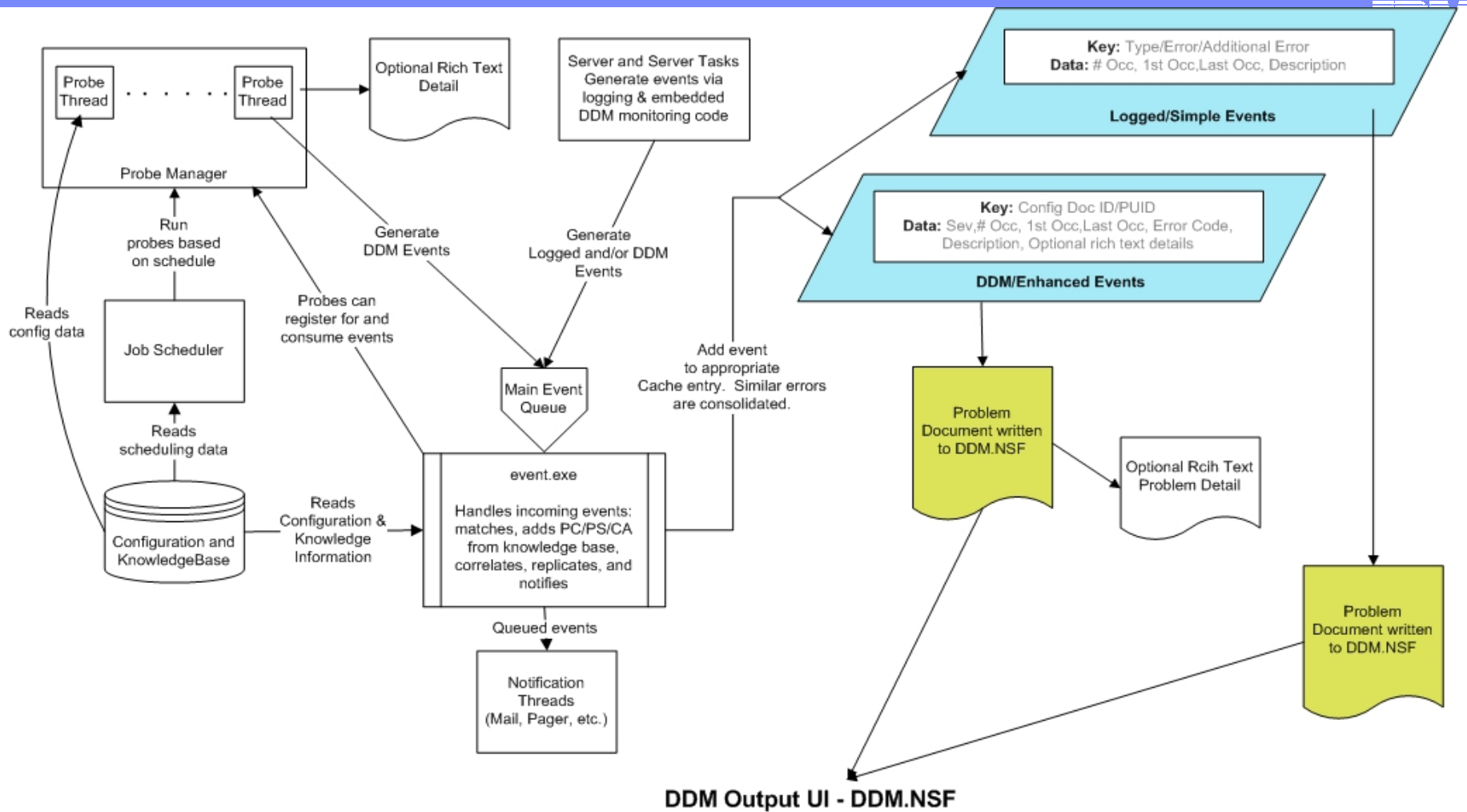
- ✍ Goals are simplicity and usability for configuration
 - ▶ Defaults are provided and can be revised over time
 - ▶ Hide complexities initially
- ✍ Small amount of initial information needed:
 - ▶ Collection server hierarchy should be created, but again, this is optional
 - ▶ Filters can be added, default filter can be modified
 - ▶ For non-default probe configurations, administrators can specify:
 - ✍ What probes should run (what features to check)
 - ✍ Where they should run (target servers, databases, etc.)
 - ✍ Optionally, how probes should run (thresholds, etc)
 - ✍ Optionally, when probes should run (schedule)



DDM Architecture – Reporting UI

- ✍ Reporting UI is a Notes database – also provides storage (DDM.NSF)
- ✍ UI distills and organizes most severe problems to facilitate quick resolution
- ✍ Problem information/capabilities:
 - ▶ Standard critical information like server, time/date, event severity, etc.
 - ▶ Multiple instances of the same event collapsed into one event document
 - ▶ Probable cause/possible solution information provided
 - ▶ Problem correlation – identical or same-root-cause events consolidated
 - ▶ Quick links/action buttons for customizable problem resolution
 - ▶ Assignment – assign events to admin owners and view events by the assigned administrator
 - ▶ Acknowledgment – this changes the state of the event from open to closed or permanently closed, after the event has been addressed or resolved.
 - ▶ Instant messaging capabilities and other features





DDM

My Events

- By Severity
- By Date
- By Type
- By Database
- By Server
- By Assignment

Open Events Recent Events All Events

All open and closed events, sorted by severity

Refresh Assign... Change State Add Comments...

#	Date	Server	All Events By Severity
929			Open
1			Fatal
1			Application Code
	Thu 04/19	Dixie/Iris	Agent Manager: 12 minute(s) have elapsed since start of agent 'OutOfOffice/OutOfOffice' in database 'mail/jobrien.nsf' ...
101			Failure



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Demonstration

Lotus software



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Server Collection Hierarchy

- Available from the DDM section in events4.nsf
- Create, delete or modify a hierarchy
- Select a hierarchy from the dropdown box
- Area51, the collecting server, includes reports from all of it's children servers
- Children servers include only their own reports

The screenshot displays the 'Monitoring Configuration' window. The left sidebar shows a tree view with 'DDM Configuration' expanded, containing 'DDM Probes' (By Author, By Probe Server, By Type) and 'DDM Filters'. The 'Server Collection Hierarchy' option is highlighted in the sidebar. The main area features a toolbar with three actions: 'New Server Collection Hierarchy', 'Delete Server Collection Hierarchy', and 'Change Collecting Server'. Below the toolbar is a 'Select Hierarchy' dropdown menu currently set to 'Area51/Iris'. A list of child hierarchies is shown below the dropdown, including 'Area51/Iris', 'Corey/Iris', 'U2/Iris', 'Support/Iris', 'Rush/Iris', 'radiohead.iris.com/Iris', 'Little-Village/Iris', and 'Jethro/Iris'. Red boxes highlight the toolbar, the dropdown menu, the selected hierarchy, and the list of child hierarchies.

Filtering

- ✍ Control the volume of Events that appear in DDM.nsf
- ✍ Specify what type of Events should be included in the Domino domain monitor database

Domino Domain Monitor Filter

Description:

Monitor Database/Directory events of Fatal/Failure severity and all Replication events

Event Filter:

Apply filter to enhanced and simple events
 Only apply filter to simple events

Event Types and Severities to Log:

Log All Event Types Log Selected Event Types

<input type="checkbox"/> Application Code	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input checked="" type="checkbox"/> Database	<input type="checkbox"/> All Severities	<input checked="" type="checkbox"/> Fatal	<input checked="" type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input checked="" type="checkbox"/> Directory	<input type="checkbox"/> All Severities	<input checked="" type="checkbox"/> Fatal	<input checked="" type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input type="checkbox"/> Messaging	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input type="checkbox"/> Operating System	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input checked="" type="checkbox"/> Replication	<input checked="" type="checkbox"/> All Severities	<input checked="" type="checkbox"/> Fatal	<input checked="" type="checkbox"/> Failure	<input checked="" type="checkbox"/> Warning (high)	<input checked="" type="checkbox"/> Warning (low)	<input checked="" type="checkbox"/> Normal
<input type="checkbox"/> Security	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input type="checkbox"/> Server	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input type="checkbox"/> Web	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal

Servers on which the filter will be applied:

All Servers in the domain
 Special Target Servers
 Only the following servers:

Hub/Caribbean

Useful Link

 Domino Domain Monitoring Redpaper

<http://www.redbooks.ibm.com/abstracts/redp4089.html?Open>

 Start using Domino 6 Server Health Monitoring now

<http://www-128.ibm.com/developerworks/lotus/library/lS-SHMnow/index.html>



News from Lotus Support

<http://www-1.ibm.com/support/docview.wss?rs=203&uid=swg27008523>

Domino Best practices

Date Published

Roaming

02 May 2007

Password Recovery

02 May 2007

Backup & Recovery

01 May 2007

Administration Process

01 May 2007

Calendaring & Scheduling

18 April 2007

Security

18 April 2007

Domino Web Access

01 March 2007

Upgrade & Migration

01 March 2007

Performance

01 March 2007

Transactional Logging

01 March 2007

Server Sizing

01 March 2007

Statistics and Events

coming soon

Domino Domain Monitoring

coming soon



Thank you!



Questions

For more information...

IBM home page

www.ibm.com

Lotus software home page

www.ibm.com/lotus

Notes client home page

www.ibm.com/lotus/notes

IBM Workplace home page

<http://www.ibm.com/lotus/workplace>

